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Expanding from Kitchen Ware to Ingots

Latest Additions to Granite City Works of National Enameling & Stamping Co. Include Plate Mill, Regenerative Type Slab-Heating Furnace and Large Sheet Plant

BY G. L. LACHER

IN the growth of iron and steel plants in this country the usual trend of expansion has been from basic materials and heavy forms of finished steel to the lighter and more specialized products, in some instances extending as far as certain types of equipment and goods for the ultimate consumer. This kind of development may be characterized as downward in contrast with the less common upward expansion whereby a maker of manufactured goods provides facilities to supply the raw materials used in production.

Upward expansion, however, is not without outstanding examples. A large agricultural implement manufacturer is well established as an operator of blast furnaces, steel works and rolling mills. Relatively recently a prominent automobile maker has inaugurated a comprehensive program for the production of pig iron and steel. But perhaps the most spectacular develop-

ment of this type has been that of the National Enameling & Stamping Co., Granite City, Ill. Its growth has been literally from kitchen ware to ingots and, if the company's allied interests are included, the range of expansion may be further extended to take in pig iron and coke.

Today an important producer of steel, and through its affiliations with the St. Louis Coke & Iron Co., Granite City, identified also with the production of pig iron and coke, the National Enameling company is still primarily a manufacturer of enameled and tin ware and stampings for household use. Its growth as a steel producer, of course, has been given impetus by the desirability of insuring a dependable and economical source of supply for its steadily expanding stamping and enameling works located in five cities in widely separated sections of the country. Latterly, however,



New 100-In. Three-High Motor-Driven Finishing Stand of the Plate Mill, Which Has a Rolling Speed of 500 Ft. Per Min. and an Estimated Capacity of 12,000 Tons Per Month. It is arranged to roll No. 8 gage and heavier in widths up to 84 in. and lengths up to 40 ft. Gear reduction and pinion housings are embraced in a single stand.

the demands of other steel consumers, particularly in the territory tributary to St. Louis, have made themselves felt to such an extent that development dictated by intra-company needs promises to give place to an expansion which will give the company an increasingly important position as a producer of ingots, semi-finished and finished steel for sale on the open market.

New Plant and Equipment

The latest additions to the capacity of the company's main steel works at Granite City comprise a 100-in. plate mill, a regenerative-type slab heating furnace, and a sheet plant embracing six hot mills and a 72-in. jobbing mill. The plate mill, a three-high motor-driven installation, replaced a steam-driven 84-in. mill. The mill comprises a roughing and a finishing stand in tandem. The rougher, which is a two-high steam-driven 100-in. reversing stand, was retained from the old mill, while the new finishing stand was installed by the United Engineering & Foundry Co., Pittsburgh, and represents its latest type of construction. This stand is driven by a 3000-hp. Westinghouse induction motor operated by 2300-volt, 60-cycle, three-phase alternating current. The motor speed is 240 r.p.m. and through reducing gears the mill speed is 50 r.p.m.

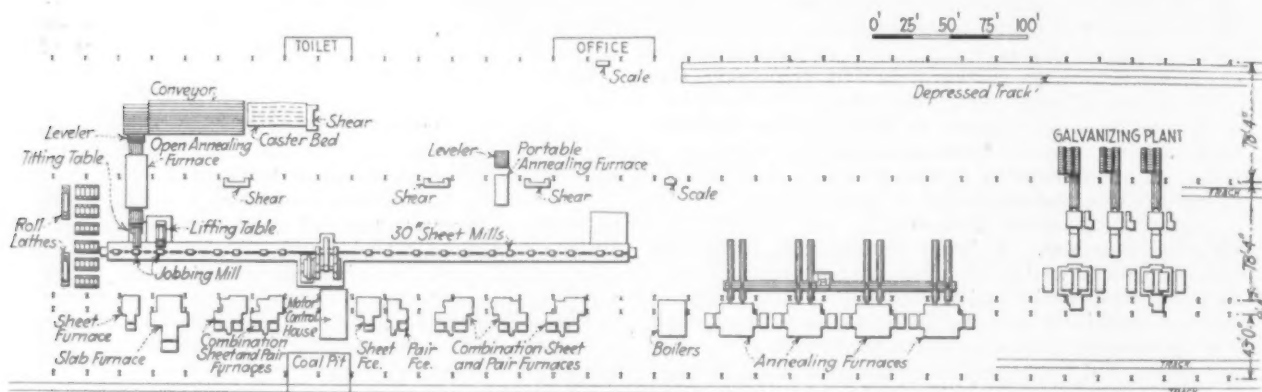
A novel feature lies in the fact that the gear reduction and pinion housings are embraced in a single stand. Kennedy reduction gears and Thomas flexible couplings

scale pit for the removal of scale to railroad cars. This scale is shipped not only to blast furnaces for remelting, but also to lead smelters in the vicinity, where it is used as a flux. It is utilized also by malleable foundries in annealing.

Special Slab-Mill Furnace

When the slab mill starts operation, slabs will be heated in a new continuous regenerative-type furnace erected back of the roughing stand of the plate mill. The furnace, which was furnished by the George J. Hagan Co., Pittsburgh, has a hearth length of 41 ft. and inside width of 10 ft. 6 in., and is provided with water-cooled skids for carrying the slabs. These skids extend the entire length of the hearth except for the final 8 ft., which is used as a soaking hearth. The slabs are charged into the furnace by means of heavy motor-driven pushers and are discharged through drop doors at the end, where they slide onto the roller table which conveys them to the mill.

A feature of the design is the absence of any columns or other furnace supports or binding beyond the discharge doors, thereby permitting an absolutely clear working space around the roller tables. The entire weight of the furnace beyond the lower combustion chamber is carried on massive columns. This construction permits easy access to the water manifolds of the skids and to the burners of the second combustion cham-



Plan of Sheet Mill, Showing Arrangement of Units in the Four Bays of the Building

are used. The rolling speed of the mill is 500 ft. per min. The estimated capacity is 12,000 tons per month. Arranged to roll No. 8 gage and heavier in widths up to 84 in. and lengths up to 40 ft., its wide flexibility is indicated by the fact that it has actually rolled 3/16-in. plate 72 in. wide by 65 ft. long. The rolls in the finishing stand are cast iron, the top and bottom rolls being 100 x 34 in. and the middle roll 100 x 22 in.

At present the mill motor is driven by 2300-volt alternating current produced in the company's own power plant, but equipment has been provided to handle 30,000-volt, 60-cycle, three-phase alternating current generated by the Illinois Power & Light Co. For this purpose three 667-kva. transformers have been placed outside the mill control house.

Two patented combined motor-operated and pneumatically-balanced tilting tables for the finishing stand were furnished by the United Engineering & Foundry Co. All the tables are operated by 250-d.c. Westinghouse motors, direct current being supplied by two 1000-kw. Westinghouse motor-generator sets. The main control panels for the mill were furnished by the Westinghouse Electric & Mfg. Co., while the control panels for all auxiliary motors were supplied by the Electric Controller & Mfg. Co.

The plate mill started rolling on June 21, 1923, and up to the time of writing has been rolling direct from ingots pending the conversion of a 36-in. steam-driven reversing universal plate mill into a combination slab and plate mill. Various sizes of ingots have been rolled in the plate mill, the largest used having been 15 in. thick and 48 in. wide by 60 in. long.

The plate mill is commanded by an overhead traveling crane, from which a grab bucket is lowered into the

ber. This second combustion chamber, located under the skids just beyond the soaking hearth, allows more rapid heating of the stock without the difficulty of having the lower surface too cold, as would be the case with the conventional design, which heats only from the top.

The fuels used are oil or by-product gas and the design is so worked out as to allow the furnace to be converted for the use of producer gas with very little alteration. The furnace operates under forced blast with very high pre-heat. The combustion spaces are made comparatively large on account of the high tonnage it is desired to heat.

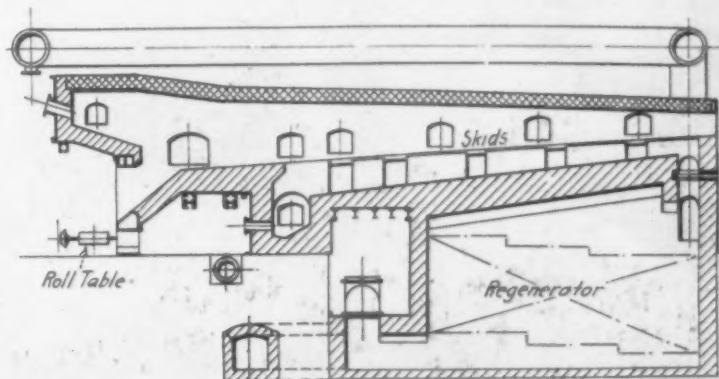
The new sheet plant, situated about a quarter mile distant from the company's steel works, is connected with it by a standard gage railroad. All sheet bars are delivered to the mill cut, thereby eliminating the transportation of scrap and likewise keeping the scrap at the sheet bar mill near the open-hearth furnaces. The rolling equipment of the new plant embraces six hot mills with a range in widths up to 48 in. and in gages from No. 30 to No. 10, and one 72-in. jobbing mill, which rolls sheets up to 60-in. wide. The United Engineering & Foundry Co. was retained as engineer in charge of building the mill. Construction started on Oct. 12, 1922, and the first sheets were rolled Sept. 24, 1923. The estimated capacity of the sheet mill is 3000 tons a month and that of the jobbing mill a like tonnage.

The mills, together with the auxiliary equipment, were furnished by the United company. The housings are steel castings of the heaviest type. On the south side of the drive are located one 30-in. diameter by 38-in. sheet mill and three 30-in. diameter by 44-in. mills. The roughing stands on this side of the mill are



Slab-Heating Furnace Is of the Continuous Regenerative Type. A feature of the design is the absence of columns or other furnace supports beyond the discharge doors, thereby leaving a clear working space around the roller table

Longitudinal Cross-Section of Slab-Heating Furnace, Which Has Rated Capacity of 20 Tons of Slabs Per Hour. Either oil or by-product gas may be used for fuel and air is furnished by a motor-fan, which draws it from a chamber over the furnace roof and delivers it to the regenerators alternately as they are reversed by the valves. The binding is very heavy and all doors are patterned after open-hearth designs, so that no metal work is exposed directly to the heat of the flames, all doors closing brick to brick



Jobbing Mill, Consisting of Two Two-High Stands of 30 x 72-in. Rolls. The roughing rolls, in the foreground, are spring-balanced and are equipped with motor-driven screw-down. The roughing stand is also provided with a lifting table, while the finishing stand is equipped with a tilting table

all spring balanced. Two stands of 26-in. diameter by 54-in. cold rolls are placed at the end of the train as a drag.

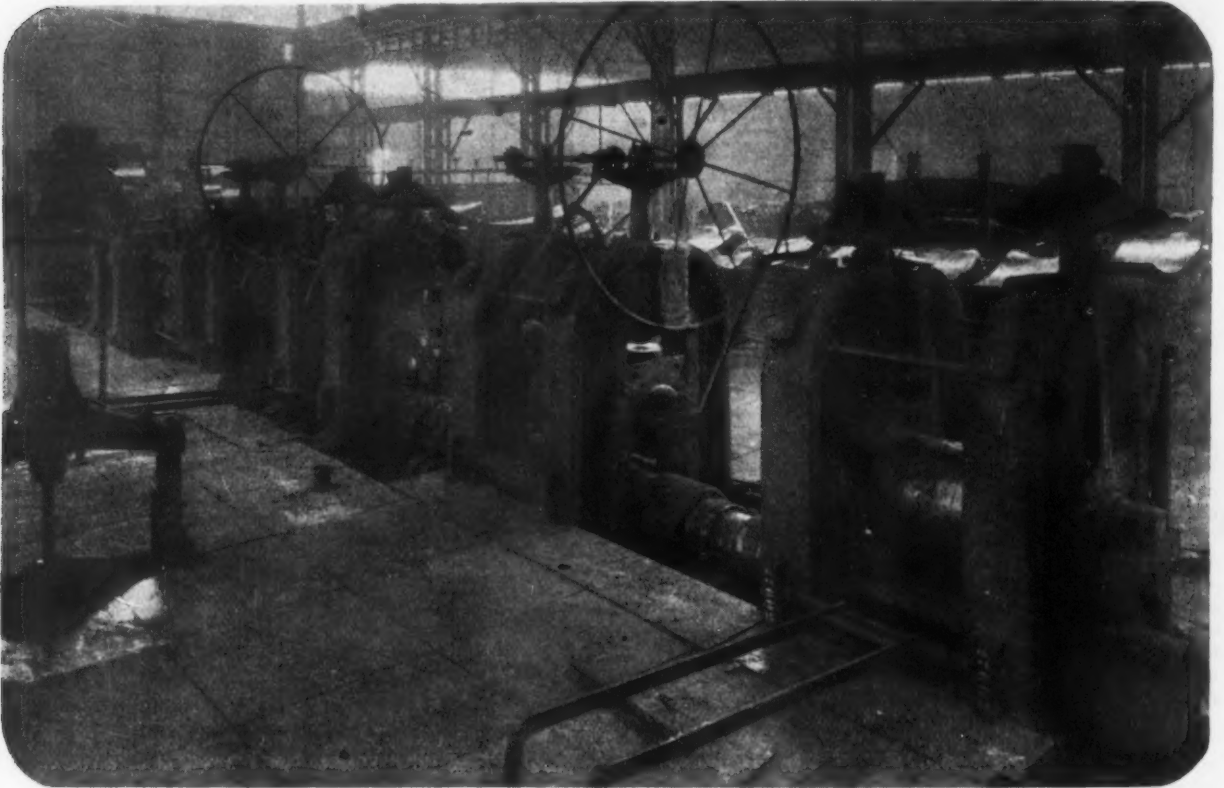
On the north side of the drive and adjacent to it are located two 30-in. diameter by 38-in. sheet mills, one roughing stand of the spring balance type and the other of the jump type, and the jobbing mill, consisting of two-high stands made up of 30-in. diameter by 72-in. long rolls. The roughing rolls of the jobbing mill are spring balanced and equipped with motor-driven screw down. A lifting table is provided on the catcher's side of the roughing stand, while a tilting table is arranged on the catcher's side of the finishing stand. As the sheets leave the finishing stand, they are carried by conveyor to a continuous annealing furnace. A 28-in. x 38-in. drag is located at the end of this train of mills.

The mills are driven by a 2000-hp. Westinghouse

heating furnace and one large single sheet furnace for the jobbing mills.

These furnaces are arranged for coal firing with Jones underfeed stokers. Each stoker has a coal hopper directly above it, which is filled with coal from a Williams single line bucket on a 10-ton overhead traveling crane. Coal is delivered on a track outside of the building and dropped through hopper-bottom cars into a coal pit of 250 tons capacity, which projects under the wall of the plant so that coal may be picked up by grab buckets on the overhead crane and distributed to the various furnaces.

Motor-driven cams regulate the valves controlling the steam cylinders which stoke the coal in the furnaces. The pair furnaces and the continuous slab-heating furnace which serve the jobbing mill are of the Costello continuous type, being arranged with elec-



Stands of Two 30-In. Sheet Mills Located on the North Side of the Drive. One of the five steam-driven doublers is in left background. The stands are of the water-cooled type and air pipes laid under the floor lead to ventilators which throw a current of air on the rollers. One of these ventilators is to be noted projecting above the floor at left center

motor running at 240 r.p.m. The United Engineering drive consists of cut herring-bone gears, which give a speed reduction of 8 to 1. A complete Bowser oiling system serves motor and drive.

Standings at the mills and furnaces are of the water-cooled type, furnished by the National Roll & Foundry Co. In addition, air pipes are laid under the floor, leading to ventilators which throw a current of air upon the rollers. Draft is supplied by motor-driven fans. Five standard 54-in. steam-driven doublers are conveniently located to serve the six hot mills. On the catcher's side of the mill the building has been made exceptionally wide to provide ample space for taking care of the sheets as they are finished. Squaring shears are so located that the shear men work in the mill building, while the scrap handlers are in the warehouse.

At the end of the mill building roll racks have been supplied for storing rolls. Behind the racks are two 34-in. heavy duty type roll lathes with inclosed headstocks, and both the lathes and the racks are commanded by a 40-ton overhead electric traveling crane, which permits the handling of rolls with a minimum of effort.

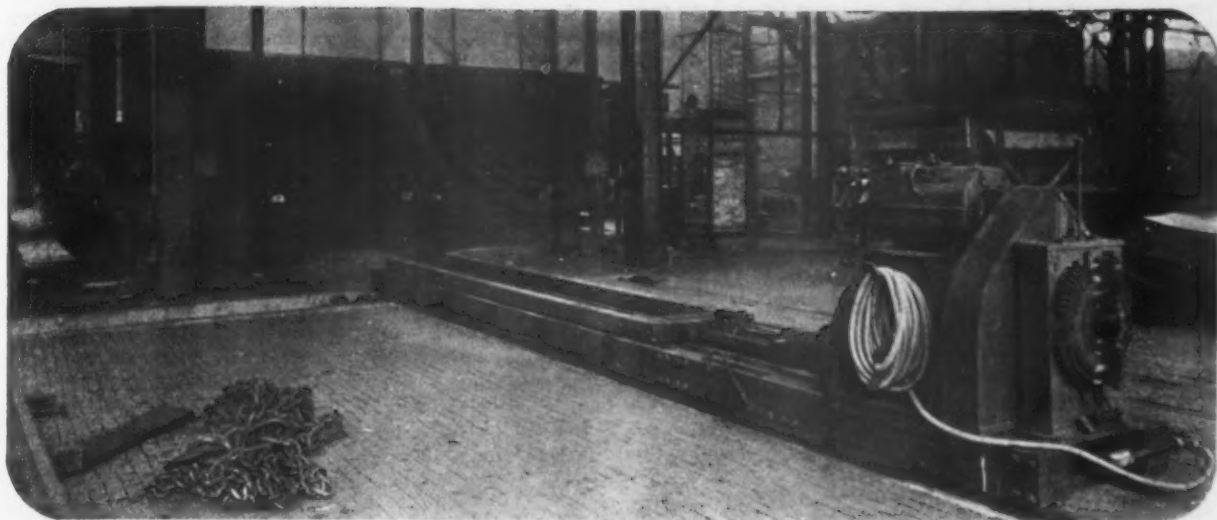
Furnished by the Tate-Jones Co., Pittsburgh, the heating furnaces embrace five combined sheet and pair furnaces, one single pair furnace and one double sheet furnace for the sheet mills, and one continuous slab

trically-operated pushers which shove the sheet bars into the furnace doors.

Labor-Saving Handling Arrangements

Unusually complete facilities for labor saving have been provided for handling the products of the sheet mills. Sheets which are to be blue-annealed are inserted in a portable blue annealing furnace which is transferred by overhead crane to any position desired. The furnace is fired by by-product coke oven gas and connections are made on any one of the columns of the mill building on the catcher's side. All sheets which are to be box annealed are sheared and carried by crane to the cold rolls. The cold rolls automatically deposit the sheets on annealing furnace bottoms. After an annealing box cover has been placed over the sheets, the box is hoisted by overhead crane and placed on an annealing furnace charging machine. The box is lifted by means of a grapppling device consisting of four long grappling hooks suspended from an oblong frame.

The charging machine differs from the conventional type which is rolled on balls, being equipped with small diameter flanged wheels which operate on tracks leading into the annealing furnaces. A rack on the under side of the frame of the charger engages a pinion from a motor-driven shaft located in a pit just under the floor elevation and at right angles to the charging



Charging Machine Differs from the Conventional Type Which Is Rolled on Balls, Being Equipped with Small Diameter Flanged Wheels Which Operate on Tracks Leading Into the Annealing Furnaces. Charging is by rack and pinion. Annealing boxes are hoisted upon and removed from the piers in the furnaces by a motor-driven lifting frame

tracks. The annealing box rests on a lifting frame actuated by motor, which hoists the box upon the brick piers in the furnace, likewise removing the box after annealing. The charging machine is transferred by overhead crane to any one of the tracks serving the various annealing furnaces. The lifting motor on the charger is connected by flexible electrical cable to plugs conveniently located in the floor.

There are four double-box annealing furnaces, coal fired, with Jones underfeed stokers and, like all of the other furnaces, furnished by the Tate-Jones Co. After annealing, the sheets are either taken to the warehouse or to the pickling department.

Motor-driven pickling equipment of the oscillator type was designed and built by the United Engineering & Foundry Co. This organization also supplied three galvanizing machines complete with roller levellers, cooling wheels, conveyors, etc. By-product coke oven gas is used for fuel and burning equipment was furnished by the Surface Combustion Co., New York. The galvanized sheets are deposited on bundling benches in the warehouse and directly under a 10-ton warehouse crane.

The product of the jobbing mill is passed through a continuous Costello blue annealing furnace and then through a United Engineering roller leveler onto a conveyor built by the C. O. Bartlett & Snow Co., Cleveland. The conveyor delivers the sheets to a set of casters directly in front of a 156-in. squaring shear. After shearing, the sheets are ready for shipment or for storage.

Building Arrangement

The plant building consists of three main parallel bays designated as warehouse, mill building and bar building, and a narrow bay styled the furnace building, connecting the bar building and the mill building. The side walls and roof are sheathed with corrugated galvanized sheets. Illumination is afforded by a row of continuous sliding sash encircling the bays just below the eaves of the roof. Ventilators have been placed in the monitors of the bar and mill buildings, while continuous sash has been provided in the monitor of the warehouse. The plant has a total length of 788 ft. and width of 209 ft. The bar building is 43 ft. wide, the



Sheet and Pair Furnaces Equipped with Underfeed Stokers. Each stoker has a coal hopper directly above it, which is filled by overhead crane. The valves controlling the steam cylinders operating the stokers are regulated by motor-driven cams, to be noted in the right foreground. Electrically-operated pushers shove the sheet bars into the pair furnace doors

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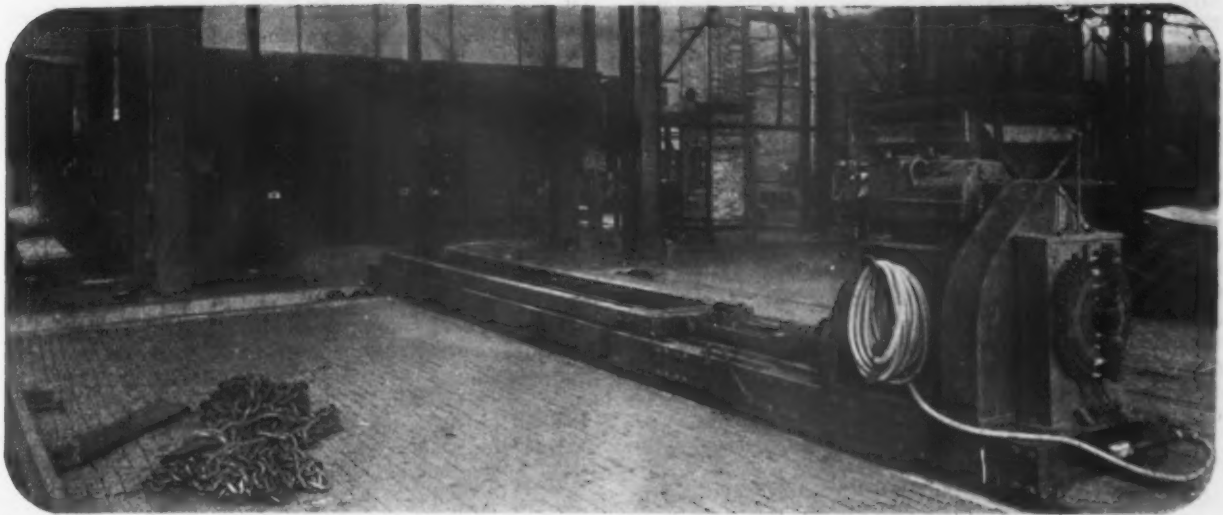
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furnace department 9 ft. 4 in. wide, the mill building 78 ft. 4 in. wide, and the warehouse 78 ft. 4 in. wide.

The arrangement of the warehouse is worthy of particular note. The finished product is logically routed so that it reaches the warehouse in the last operation just prior to shipment. The product of the jobbing mill is sheared and made ready for shipment under the warehouse crane. All black sheets are sheared in the warehouse side of the mill building, where they can be readily transferred with a minimum of effort to the warehouse crane. All galvanized sheets are deposited under the warehouse crane ready for bundling and shipping. A depressed shipping track with a capacity of from 9 to 10 cars is located in the south end of the warehouse, so that all loading is indoors and weather conditions may be disregarded. The plant building was designed, fabricated and erected by the Mississippi Valley Structural Steel Co., St. Louis.

Six electric traveling cranes were furnished by the

Alliance Machine Co., Alliance, Ohio. The mill room is commanded by a 40-ton crane and a 20-ton crane, the bar storage by two 10-ton cranes and the warehouse by two 10-ton cranes. The cranes, as well as variable speed motors in the mill, are operated by 220-volt direct current furnished from a 500-kw. motor-generator set. The mill drive uses 2300-volt alternating current stepped down from 30,000-volt, 60-cycle, three-phase alternating current, which is purchased.

For the auxiliary motors, 440-volt alternating current is used, and for the lighting system, 110-volt alternating current. The Westinghouse Electric & Mfg. Co. furnished the drive and crane motors, while the remaining motors were supplied by the General Electric Co. Steam to operate the doublers and for use in the pickling department is supplied by two 205-hp. Heine boilers equipped with Illinois chain grate stokers. Hoppers over each stoker are filled from a coal bucket on the bar storage crane.

Awards to General Electric Employees for Industrial Service

Constructive work of factory employees in industry has been recognized in a conspicuous way by the General Electric Co. At the various plants of the company a few days ago workmen gathered about a platform, and the works manager called a few of their number forward and presented them with a sum of money and a certificate acknowledging their contribution to the progress of the electrical industry. These awards were made by the Charles A. Coffin Foundation, named in honor of the founder of the company, which was established for the broad purpose of stimulating progress and public service in all branches of the electrical industry—public utilities, electric railroads, among graduate students doing research work, and finally among employees.

There were 150 nominations for awards made by department and office heads. These were reduced to 79 for final analysis, and awards were finally made to 48—16 to engineers, 6 to commercial men and 1 woman, 10 to foremen, 10 to shop workers and 5 to administrative employees. There was keen competition among the factory managers to obtain representation for their men on the list. It is believed that this method of recognizing ability is a step forward in promoting amicable relations between employees and management.

Sulphur in Coke Removed by Steaming

Experimental work on a laboratory scale on the desulphurization of coke by steam, conducted by the Department of the Interior and the Carnegie Institute of Technology at the Pittsburgh experiment station of the Bureau of Mines, is claimed to have demonstrated that the steaming process effects a greater sulphur removal than other processes. The economic importance of the results of the experiments is that they point the way to future utilization of enormous reserves of high-sulphur coals not now suitable for coke making.

In a report giving the results of these experiments, made by Alfred R. Powell, associate chemist, Bureau of Mines, and John H. Thompson, research fellow, Carnegie Institute of Technology, it is pointed out that sulphur in metallurgical coke gives rise to many problems and difficulties in furnace operations. Over 1½ per cent of sulphur is likely to produce an inferior grade of iron. Sulphur will, in addition to causing trouble in the furnace, make it difficult, if not impossible, to work the iron. Any process for removing this deleterious substance from the coke is therefore of value to both the manufacturer and consumer of coke, if the cost is not prohibitive.

The investigators at the Bureau of Mines laboratories found that between 10 and 15 per cent of the total sulphur in the coke is removed by simple steaming

at 750 deg. C. With alternate vacuum and pressure treatment the desulphurization is increased to 20 to 25 per cent. Furthermore, it is believed that the steaming is much more beneficial than the actual sulphur reduction indicates, since the sulphur removal is almost entirely taken from the surface of the coke, and this surface sulphur may be the part that is easily absorbed by the iron in the blast furnace.

The rapid growth of the by-product coking industry serves to simplify the matter of a cheap steam supply. Large quantities of heat are now allowed to go to waste, but this heat could be well utilized in the generation of steam. Thus it is expected that the process of steam coke could be made comparatively inexpensive.

The investigators point out that when it becomes necessary to resort to the use of higher sulphur coals for the manufacture of coke, the improvement of the coke through steaming may be of sufficient value to warrant the expense of the process.

The results of this investigation are given in Bulletin 7 of the Coal Mining Investigations Series, which may be obtained from the Carnegie Institute of Technology, Pittsburgh, at a price of 30c.

Idleness in Construction Industries

WASHINGTON, March 11.—Seasonal idleness in the construction industries is due mainly to custom and not climate, says a report adopted on Wednesday of last week by the Committee on Seasonal Operation in the Construction Industries when it met with Secretary of Commerce Hoover. The report is to be published and is being prepared for that purpose. It is of a voluminous character and is elaborately illustrated.

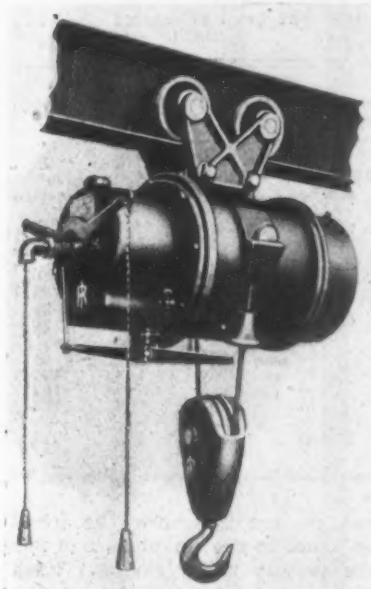
The report points out that cities of the South and Pacific coast show much the same seasonal idleness as do those on the Canadian border and that most of these seasonal up and downs are undoubtedly preventable. According to the committee, modern methods of winter construction are being found to compare favorably with summer work, as to both cost and progress. This has had a marked effect on producers of building materials, transportation companies and on employees in the building trades. The report declares that the construction industries deserve the support of the public in their efforts, as the burden of idleness falls most heavily on the public and the workers.

Responsibility rests largely with the public, the committee urges, if conditions are to be improved. Community surveys are advocated to be made by organized local groups. Through surveys, it is stated, facts may be obtained of average and extreme weather conditions affecting construction; of employment statistics in each of the principal trades; of construction by classes of work, and contracts drawn in terms of time and money lost through concentration of efforts in a few months of the year.

Completes Line of Air Motor Hoists

A line of air motor hoists in five sizes, ranging from 500 to 10,000 lb. capacity, has been placed on the market by the Ingersoll-Rand Co., New York. The four larger sizes are similar in general features to the 500 lb. air motor hoist described in *THE IRON AGE* of Nov. 8, 1923, except for variation in the gearing of the two heaviest sizes and other details.

Among the features are compactness of design, resulting in low head room required, automatic brake to hold the load under all conditions, and a graduated throttle intended to permit close regulation of lifting and lowering speeds. It should be noted that these hoists are distinct from the direct acting cylinder type of hoists and lifts, being equipped with an air motor which is geared through a mechanical train to a hoisting drum. Details of the throttle graduation, automatic brake and other features were given in the previous description.



Compactness, Automatic Brake and Speed Control Throttle Are Features

At 80 lb. air pressure the rate of lift is 50 and 10 ft. per min. for the smallest and largest hoist, respectively. The maximum lift is 15 ft. for all sizes.

The net weight of the hoist equipped with top hook ranges from 150 lb. for the smallest and 760 lb. for the largest hoist. The machines operate on air pressures from 60 to 100 lb. Either roller bearing mono-rail trolley or top hook mounting may be provided, the trolley arrangement requiring the minimum of head room.

Diesel Engine Non-stop Record

A continuous run of 202 days, under actual working conditions, is reported by the Worthington Pump & Machinery Corporation, New York, for a Worthington-Snow Diesel engine.

The engine is a standard 562 hp., four-cycle, air injection type operating at 225 r.p.m., and is used by the city of Horton, Kan., for city lighting and power purposes. It drives an alternating current generator in parallel with another unit, which is emphasized as evidence of close governing as well as continuity of performance through the entire period. The engine has three cylinders, each 22½ in. x 22½ in. and of the so-called square type. The pistons are oil cooled. Lubrication is forcibly fed to all parts of the engine.

Plunger Suspension for Hanna Riveters

A new accessory for Hanna type pneumatic riveters of the Hanna Engineering Works, Chicago, is a plunger suspension arrangement intended to improve the operating characteristics of the machine.

In this arrangement the upper die is stationary and the lower die is movable when suspended with dies vertical and cylinder up. This permits rivets to be struck from the top and driven from the bottom. Increased production for a given number of men in the operating crew is claimed, and rivets may be struck far in advance of the riveter. Other advantages are

that each rivet demands less of the "sticker-in's" time, and continuous operation of the riveter.

The suspension is made from the plunger by means of a chain which passes over a sheave on the upper toggle pin and under a sheave placed at the top of the machine so that the chain leading therefrom to the suspension hook is directly above the center of gravity of the riveter when the die screw axis is exactly vertical. Operation of the mechanism to advance the plunger out of the frame barrel toward the lower die results in the entire frame being lifted, since the plunger cannot go down, with the result that the lower die rises, advancing upon the protrusion of rivet shank below the work and driving the rivet head from below.

This suspension rigging is additional to and independent of the bale suspension and when furnished the riveter may be suspended by either method.

Universal Welding Machine

The Electric Arc Cutting & Welding Co., Newark, N. J., has placed on the market a new model welder called the "Universal Welding Machine," the term universal being applied because of the adaptability of the machine to any industrial power supply.

Machines applicable to one or two voltages such as 220-440 or 110-220 have been built by the company heretofore. The new machine is intended to broaden the scope so that practically any power supply can be made with one unit of the apparatus. The unit is no larger than the previous equipment.

The 110-220-440 volt combination is obtained by multiple, series multiple and series combinations of the coils of the primary winding. To make the machine operate on 25 and 40 cycles, taps and adaptor windings are used to obtain the proper electrical characteristics. The difficulties overcome in this development may be judged when it is considered that the blower and automatic switch must operate also on these various voltages. The apparatus is also made operative on 110 and 220 volts, direct current, by means of a resistor-reactor combination inserted in the secondary winding.

To Reduce Varieties of Tanks

Manufacturers of tanks and manufacturers of equipment in which tanks are used are meeting this week at Washington in a series of conferences under the auspices of the division of simplified practice of the Department of Commerce looking to the elimination of seldom-used sizes and varieties of tanks. Those present include manufacturing representatives from a number of States, as well as delegates from the National Board of Fire Underwriters, American Institute of Architects, American Society of Sanitary Engineering and other technical groups and from fire departments of a number of leading cities.

The conferences deal with hot water storage tanks, cold water storage tanks, pneumatic tanks, gasoline underground storage tanks, distillate and fuel oil storage tanks, and air receivers.

The meeting is a sequel to conferences held during January. At that time manufacturers of hot water storage tanks agreed on tentative recommendations reducing their products to five sizes and two working pressures. Manufacturers of pneumatic tanks, at that time also, were in favor of a reduction of their products to nine sizes and one working pressure. These developments resulted in a request to the division of simplified practice for assistance in bringing about simplification of cold water storage tanks, gasoline storage tanks, fuel oil and distillate tanks, storage tanks for oil heating systems, and air receivers.

Twenty of 35 largest industrial plants of Worcester, Mass., went through January without an accident which resulted in lost time to any worker. Of the total number of employees represented in the 35 firms reporting, there was an average of 0.27 per cent of lost time accidents in that month, representing a loss of 7.15 single days for each 100 employees.

A Century of Incoming Alien Peoples

Immigration from 1819 to 1923 Analyzed by Races and by Nationalities—Last Decade of Nineteenth Century Marked Change

IMMIGRANTS into the United States from Oct. 1, 1819, to June 30, 1923, numbered 35,292,506, according to a statement of the Secretary of Labor,* or an average of 340,169 per year over the whole period. The first year which reached a figure exceeding this average was 1851. This was during a heavy migration from Great Britain and Germany—the heaviest we have ever had from Great Britain and, except for a similar movement in the early "eighties," the heaviest we have ever had from Germany. Not until 1880, however, did the incoming flow of immigrants reach what might be called a permanently high plane, with each year, barring an occasional exception, beyond the average for the whole period. In 1882 the figure first passed 750,000. It did not again reach this magnitude until 1903, but in the next eleven years there were six in each of which more than 1,000,000 immigrants arrived, the maximum being 1907 with 1,285,349. Both 1913 and 1914 (years ended June 30) showed figures closely approaching this.

Until 1895 the immigration from Northern and Western Europe was consistently more than half the total. Beginning with 1896 there has not been a year in which the incoming number from Northern and Western Europe reached anything like half the total. In that year, for the first time, the number from Eastern and Southern Europe was more than half the

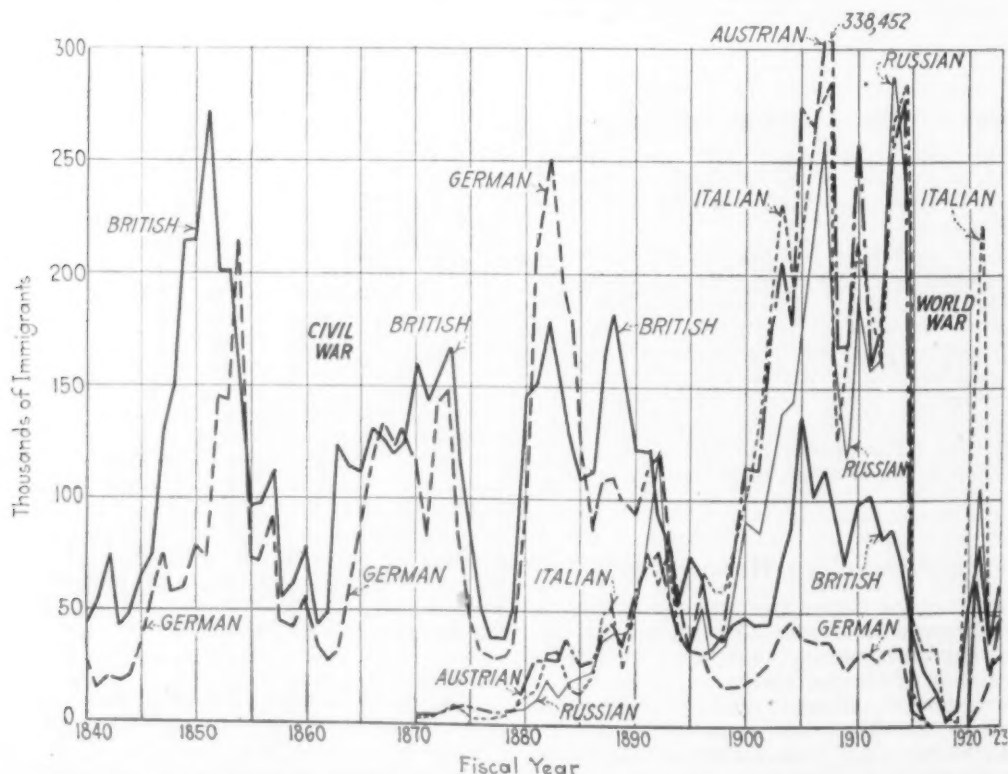
aggregate and that condition has obtained every year since then, with the exception of the war years and those immediately following and the years in which the Dillingham quota law has been effective.

Table I.—Immigration Into the United States, by Great Groups (In Thousands)

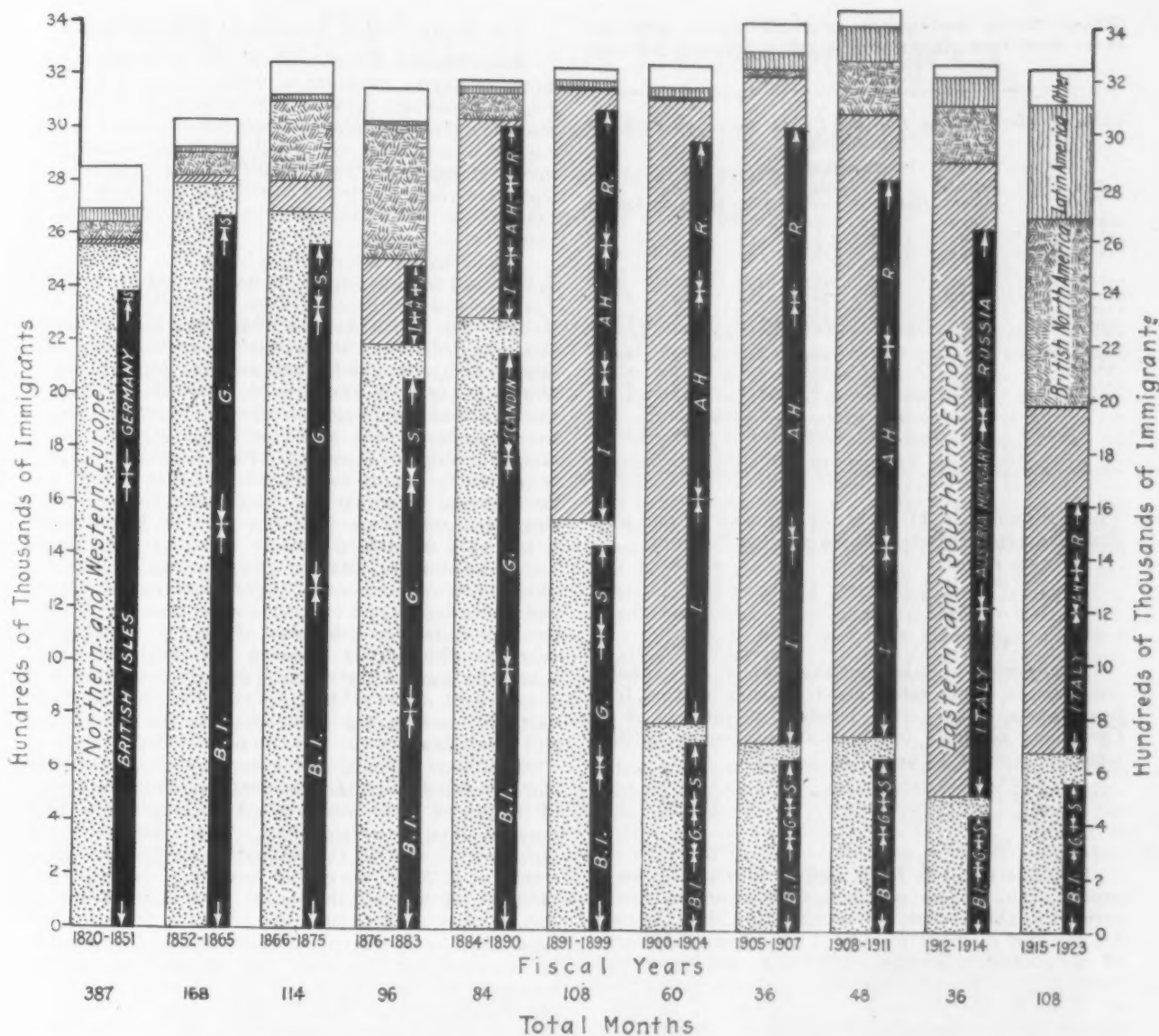
Fiscal Years	Total	Northern and Western Europe	Southern and Eastern Europe	British North America	Latin America
1820 to 1851	2,845	2,554	16	65	52
1852 to 1865	3,014	2,781	30	86	18
1866 to 1875	3,239	2,680	118	302	19
1876 to 1883	3,148	2,190	322	495	15
1884 to 1890	3,186	2,294	745	99	28
1891 to 1899	3,239	1,539	1,617	3	31
1900 to 1904	3,255	780	2,344	6	38
1905 to 1907	3,413	707	2,506	27	64
1908 to 1911	3,456	731	2,350	204	122
1912 to 1914	3,255	510	2,382	216	107
1915 to 1923	3,241	673	1,309	706	423
Totals	35,292	17,439	13,739	2,209	917

One diagram shows in graphic form the great change which has taken place in the complexion of our immigration during the century under review. Each vertical column represents about 3,000,000 immigrants, the separation, year by year, having been so made as to give the closest possible grouping around the 3,000,000 mark. Made up in this way, the duration of the several periods varies considerably, there being two cases of 36 months each, while in the earlier years—the column at the left—the time covered was 387 months, or a little more than 32 years. In each case

*Because of changes in national boundary lines during the century, as well as in the methods of collecting the original data, it is pointed out that the figures are indicative rather than exact. Thus, for several years, no record was made of immigrants from Canada. Poland was reported variously, as Poland, or as split among Russia, Austria and Germany. Early figures of "alien passengers arriving" gave place to "immigrants arriving," then to "aliens admitted" and finally to "immigrant aliens admitted."



Successive Huge Waves of Immigration, Separated by Periods of Low Intensity, Have Marked Our Absorption of Aliens. British and Germans dominated until 1900; South Europeans since then



Groups of About 3,000,000 Immigrants, Each Group Covering Three or More Fiscal Years, Have Been Subdivided Above Into Their Major Components—Northern and Western Europe, Eastern and Southern Europe, British North America, Latin America and All Other. Under the two first headings a further partial subdivision has separated out in each case the three chief nationalities

the totals were for the fiscal years reported by the Government.

From this diagram it appears that the incoming movement from Northern and Western Europe maintained its full force through 1890, with a decreasing proportion of British, and an increasing proportion of Scandinavian, incomers during that period. The nine years from 1891 to 1899 inclusive provided a transition stage, in which the influx from Eastern and Southern Europe became first equal and then superior to that from Northern and Western Europe. Since the beginning of the present century the great bulk of our immigration has been from the South and East of Europe, with the Nordic races reaching their minimum in the three years immediately preceding the great war (15.67 per cent of our total immigrants, compared with 73.2 per cent for Eastern and Southern Europe).

Our other diagram traces, across the past 84 years, the great influx of five separate nationalities—British, German, Italian, Austrian and Russian—Poland being included with Russia, except insofar as the reports incorporated portions of the Polish race with Germany and Austria, respectively. This diagram shows that the immigration has come in in a series of great waves. Between these waves have been periods of small movement of peoples, due in large measure to local causes, such as the American Civil War, the virtual stoppage of migration during the World War, and the bad industrial position of the United States in the "seventies" and again in the middle "nineties."

Among the great waves of migration of peoples shown in the diagram there were four, particularly, from the British Isles, each of which was from 10 to 12 years' duration. These were as follows:

1847 to 1857	1,849,000
1863 to 1875	1,616,000
1880 to 1892	1,824,000
1904 to 1913	978,000
Total	6,267,000

In the 47 years comprised in these four British waves more than 74 per cent came in, of all our immigrants from the British Isles in 100 years. Similarly, from Germany we received 69 per cent of the total century's immigration in three big waves, as follows:

1850 to 1857	889,000
1865 to 1874	1,099,000
1880 to 1893	1,849,000
Total	3,837,000

Italian immigration came in great bulk in two huge waves. From 1899 to 1914 there were 3,113,000, while in 1920 and 1921, 317,000 more came in, or a total of 3,430,000 in these 18 years, this being 76 per cent of the entire Italian incoming movement in the century covered. One great wave of Austrians and Russians, lasting from 1900 to 1914, accounted for 75 per cent of the Austrian immigrants and 70 per cent of the Russians, there being 3,131,000 Austrians and 2,556,000 Russians admitted during those 15 years.

Scandinavian immigration has been steadier than any of the others mentioned. There are no such well

defined major movements as those above, although there were four waves of more than average intensity

Table II.—Immigration Into the United States, by Principal Nationalities

Fiscal Years	(In Thousands)					
	British Isles	Germany	Scandinavia	Italy	Austria-Hungary	Russia
1820 to 1851	1,686	667	20	5	...	1
1852 to 1865	1,509	1,112	39	12	1	3
1866 to 1875	1,264	1,063	229	35	39	27
1876 to 1883	811	866	382	108	125	73
1884 to 1890	972	797	398	228	269	221
1891 to 1899	612	487	340	552	478	511
1900 to 1904	296	155	257	839	783	565
1905 to 1907	353	116	169	780	879	660
1908 to 1911	366	121	153	710	757	623
1912 to 1914	245	98	89	706	712	709
1915 to 1923	317	87	144	530	156	260
Totals	8,431	5,569	2,220	4,505	4,199	3,653

which supplied, in 11 years, 36 per cent of our total Scandinavian incomers. These were as follows:

1880 to 1883	325,000
1887 and 1888	150,000
1891 and 1892	126,000
1903 to 1905	198,000
Total	799,000

A somewhat similar condition applies to Canadian immigration, which totals about the same as that from Scandinavia. There were, however, 49 per cent of the Canadians admitted in three distinct waves, with a total duration of 13 years, as follows:

1880 to 1883	394,000
1913 to 1917	449,000
1920 to 1923	238,000
Total	1,081,000

In Table I will be found figures showing, by major groups, the sources of immigrants over the period covered in this review. This table furnishes the basis for the first diagram mentioned and shows the sources of more than 35,000,000 additions to our population. Table II gives the immigration in the same year groups as Table I, for six nations or groups of nations—British Isles, Germany, Scandinavia, Austria-Hungary, Italy and the Russian-Polish group.

Slight Decrease in February Construction

February building contracts in the 36 Eastern States (including about seven-eighths of the total construction in this country) amounted to \$299,929,100, according to F. W. Dodge Corporation. This was a decrease of 1 per cent from January, and an increase of 7 per cent over February of last year. January showed an increase of 23 per cent over January, 1923. The combined total for the first two months of this year shows a 15 per cent increase over the corresponding period of 1923.

This increase over last year is principally in New York State and northern New Jersey and is mainly due to a continued large volume of speculative residential building in New York City. New England and the Southeast show very moderate increases over last year; the remaining sections show moderate decreases. Moderate decreases are normal for this present phase of the building cycle. The large increases in the New York district at the present time are abnormal.

The February record showed increases in commercial and educational buildings and public works and utilities, and decreases in industrial and residential buildings. In detail the February record showed 47 per cent for residential buildings; 16 per cent for commercial buildings; 13 per cent for public works and utilities; 10 per cent for educational buildings, and 6 per cent for industrial buildings. Contemplated new work reported in February amounted to \$504,647,400, a decrease of 25 per cent from the amount reported in January. Such a decrease is usual at this season.

To Scrap Naval Vessels at Philadelphia

WASHINGTON, March 10.—The Navy Department's policy of having navy yards, where the work could be done to advantage, cut up a number of the vessels which are being scrapped in accordance with the treaty limiting naval armament will result, it is estimated, in a saving of approximately \$400,000 over the highest bids that were received for the vessels on an "as is" basis, Capt. D. W. Bonnaffon, officer in charge, sale of naval vessels, stated today.

The battleship *Delaware* which is now at Boston, is to be towed to Philadelphia, to be scrapped at the Navy Yard there, where it can be done for much less than in Boston. The highest bid "as is" received for this battleship was \$36,666. The material from this vessel was offered at auction in Boston, and the highest bidder, Morris Schapiro, Boston Iron & Metal Co., Baltimore, has agreed to pay \$3 per ton more if the material is delivered on board cars at Philadelphia. As the cost of cutting to shipping sizes at the Philadelphia Navy Yard is only \$8 per ton, as compared with \$10 in Boston, and the material on account of freight charges and other conditions, will bring \$3 a ton more at Philadelphia, it has been decided to tow the vessel to Philadelphia and scrap it there. As the gross returns at Philadelphia will be approximately \$53,550 more than at Boston, and the saving in cost of cutting approximately \$35,700, this will make a total increase of \$89,250. Towing the vessel to Philadelphia, insuring her, making the ship seaworthy and loading material already cut will cost, it is estimated, about \$15,000. So that the transfer of the battleship and having it scrapped at the Navy Yard will result in a net saving of some \$74,250.

This is an example of the increased returns to the Government through the efforts of the officers in charge of the sale of naval vessels to get the largest net yields possible from these old ships. The material in the *Delaware*, figured on the estimated tonnage will bring a total of \$273,625, the cost of scrapping is estimated at \$150,000, of moving the vessel to Philadelphia \$15,000, a total of \$165,000. So that the indicated net return will be approximately \$108,625. As the highest bid received for the vessel "as is" was \$36,666, the scrapping of the *Delaware* by the Navy Yard will result in a return of \$71,959 more to the Government than if it had been sold to the highest bidder as it stands.

The increased returns in having the *Michigan*, *Minnesota* and *Kansas* scrapped by the Navy will amount to more than \$250,000 over the highest offers received on an "as is" basis. The highest bids received for these vessels were: *Michigan*, \$40,000; *Minnesota*, \$37,760; *Kansas*, \$45,000; total for the three vessels, \$122,760. The material for these vessels was sold at auction several weeks ago at \$14.05 for the steel, iron, piping, etc., and \$14.10 per gross ton for the armor, cut to shipping sizes. The total gross returns from the material in these vessels is estimated at \$645,000. Through improved methods and efficiency, the Philadelphia Navy Yard is doing the cutting for much less even than the estimates. Though \$110,000 was allotted for dismantling, cutting and loading for each ship, the indications are that this can be done for less than \$90,000, possibly for \$85,000 per ship. The cost of scrapping the three, at the higher estimate, would be only \$270,000. This would give a net return from these three vessels of \$375,000. As the highest bids for them amounted to only \$122,750, the Government will, by having the vessels scrapped by the Navy Yard, receive \$252,240 more than if they had been sold outright at the best prices offered.

The first National Chemical Equipment Exposition will be held in the State Armory, Providence, R. I., June 22 to 27, under the management of the Chemical Equipment Association, and in conjunction with a regular 4-day meeting of the American Institute of Chemical Engineers. The exposition will be restricted to displays of equipment, supplies, accessories and essential raw materials used by the chemical and chemically controlled industries.

Effect of Anneal on Brass Surfaces

High Ductility Obtained Only by Losing Smoothness—
Grain Size Under Microscope a Measure of Both
Ductility and Amount of Annealing

BY J. L. CHRISTIE*

IT frequently happens that a purchaser of sheet brass does not know the generally accepted meanings of the terms which he uses. The brass manufacturers have not as yet accurately defined these terms and the result is that often a purchaser orders one thing when he really wants another. Instances are known in which a purchaser has ordered dead soft brass when he should have ordered light annealed brass. Through the examination of samples of satisfactory material or of the part which is to be made from the brass, the mill has learned what will be satisfactory and has supplied it. The mill has not, however, told the purchaser what he really wanted and the purchaser has continued to order dead soft brass and to receive light annealed brass. Sometimes the necessary information is not given to the producing mill, with the result that unsatisfactory material is shipped, is complained about and is returned for credit.

Most of the sheet brass used in this country contains two parts of copper and one part of zinc. The chemical requirements are satisfactorily stated in section II of A. S. T. M. specifications B 36-21. As indicated in section III of this specification, this one mix-

*In charge of laboratory research department, Bridgeport Brass Co., Bridgeport, Conn.

ture is susceptible to various treatments which produce widely different properties in the material and which fit it for widely different uses.

In annealed brass it is possible to vary the properties considerably by varying the amount of annealing. An anneal at a low temperature will produce brass with a relatively high tensile strength and hardness as determined by the Brinell test, a relatively low ductility and a relatively fine grain when examined under the microscope. By increasing the amount of annealing, brass will be obtained which has a lower tensile strength and Brinell hardness, a higher ductility and larger grains. By increasing the anneal still further it is possible to overheat or burn the metal, which results in a further decrease in tensile strength and Brinell hardness, a reduction in ductility and the development of what is known as "beta" brass, which is visible under the microscope.

The size of the grains as shown by the microscope determines the nature of the surface which will be obtained when brass is cupped and formed. If brass contains small grains the surface will be very smooth after cupping or forming. If it contains large grains the surface will be rough and will be what is known as "orange peel." It is obvious, then, that the greatest

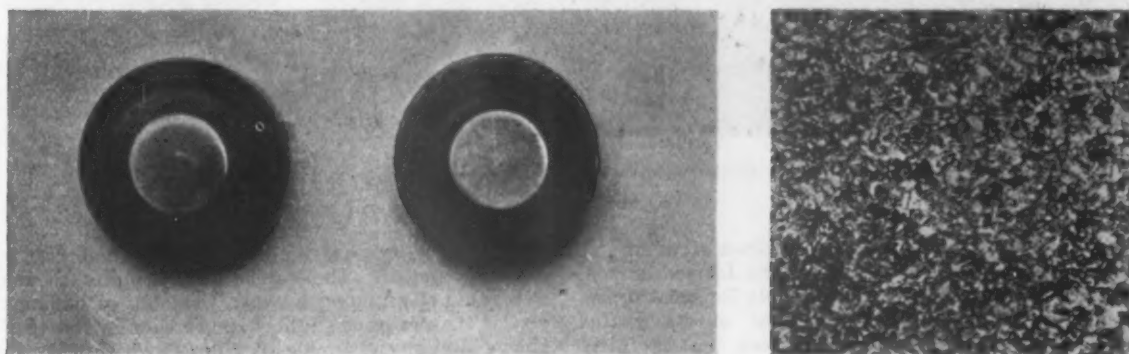
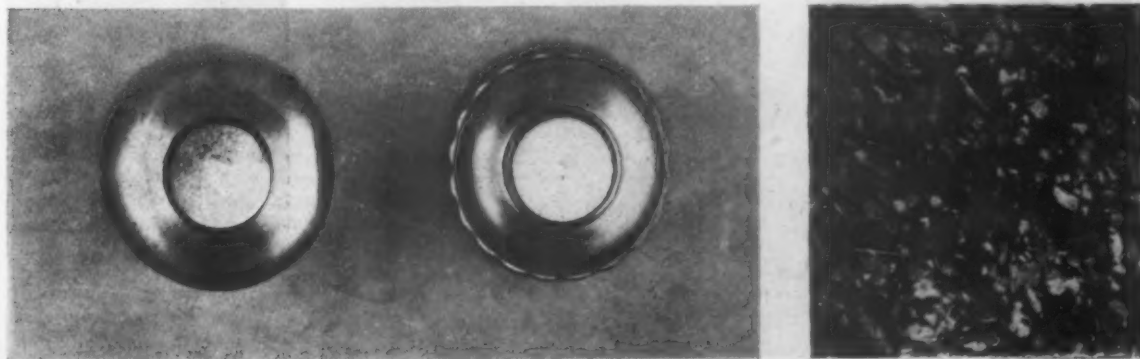


Fig. 1—(Above)—Cups Made from Brass With a Light Anneal and Photomicrograph Magnified 75 Diameters—Both Reduced About One-Fifth in Reproduction

(All six samples shown in this article have the same 75-diam. magnification and all were etched with $\text{NH}_4\text{OH} + \text{H}_2\text{O}_2$)

Fig. 2—(Below)—Cups Made From Brass With a Drawing Anneal—Reduced About One-Fifth



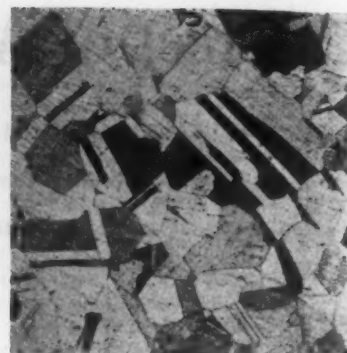
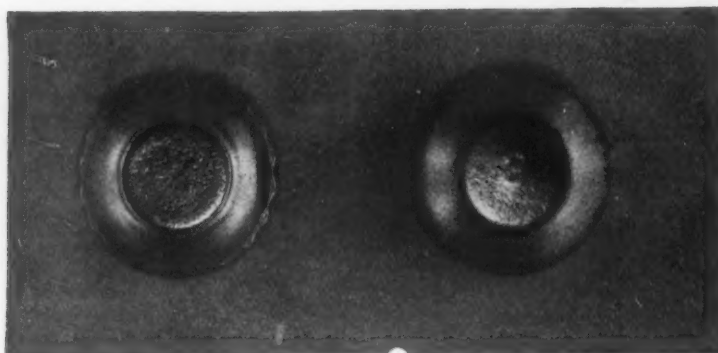


Fig. 3—Cups Made From Brass Which Had Received a Soft Drawing Anneal—Reduced About One-Sixth in Reproduction

ductility of brass is obtained by giving it an anneal which enlarges the grain to such an extent that the formed surface will be rough. This point is largely overlooked by purchasers of sheet.

The three anneals designated by the A. S. T. M. specifications B 36-21 are light anneal, drawing anneal and soft drawing anneal. Light annealed brass has been annealed sufficiently to permit it to be worked to a moderate extent. It still retains a certain amount of

the maximum amount of ductility but this is obtained at the expense of smooth surface. The large grains produce a fairly rough surface after forming. The term dead soft indicates that a rough surface will be obtained.

Fig. 1 shows two small shallow cups made from brass which had received a light anneal. You will notice the smooth surface of the cups and the fine grain as shown by the photomicrograph. Fig. 2 shows some

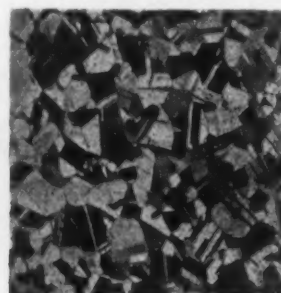
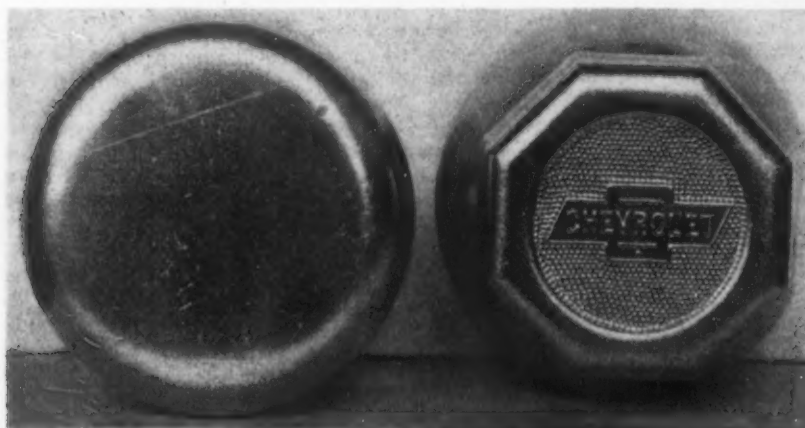


Fig. 4—Cups Made From Heavier Brass With a Drawing Anneal—Reduced About One-Third

stiffness and, because of its fine grained structure, it produces a very smooth surface on the formed article. Brass with a drawing anneal is suitable for most drawing and forming operations. Because of its grains of moderate size it will give a surface that is fairly smooth and that will not require an excessive amount of buffing.

Brass that has received a soft drawing anneal is used for the most severe drawing operations. It has

similar cups made from brass which had received a drawing anneal. The surface is not quite so smooth, but would clean up with a small amount of buffing. The size of the grains is slightly larger than in No. 1. Fig. 3 shows similar cups made from brass which had received a soft drawing anneal. The surface is quite rough and the grains are quite large.

Fig. 4 shows two cups made from heavier brass which had received a drawing anneal. The surface is

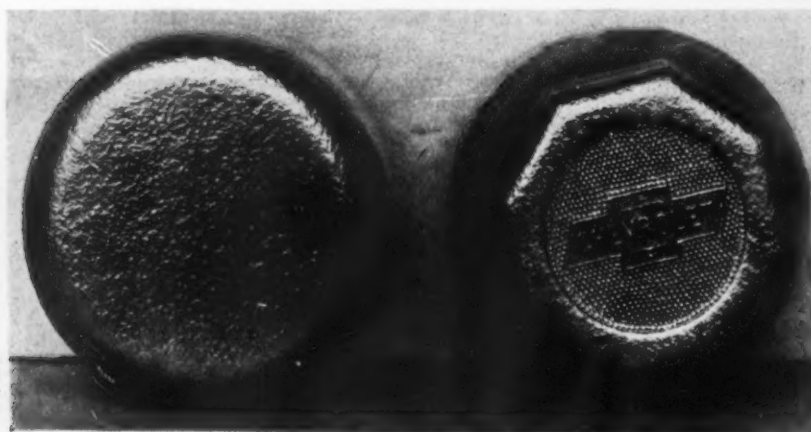


Fig. 5—Cups Made From Brass With a Soft Drawing Anneal—Reduced About Three-Eighths

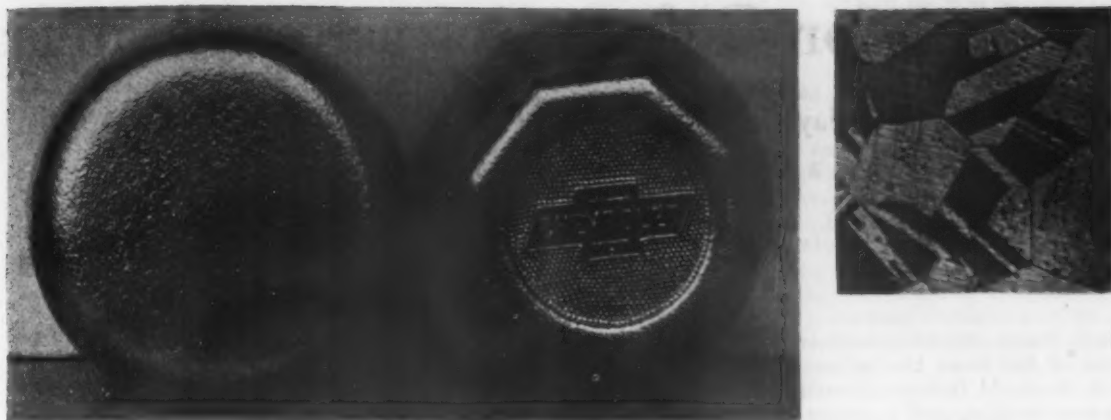


Fig. 6—Cups Made From Overheated Metal—Reduced About Three-Eighths in Reproduction

fairly smooth and would clean up nicely with a moderate amount of buffing. The photomicrograph shows the grain size. Fig. 5 shows two cups made from brass which had received a soft drawing anneal. The surface is extremely rough and the grain size extremely large. Fig. 6 shows cups made from metal which had been overheated. The surface is very rough. The fact that the metal had been overheated is shown by the heavy boundaries between some of the crystals, as shown in the photomicrograph.

There are some jobs which require more ductility

than it is possible to obtain in high sheet brass without developing the coarse grain. In such cases it is usual to specify cartridge brass, which contains 70 per cent of copper and which is lower in impurities, lead and iron. (See specifications B 19-19 of the A. S. T. M.)

These remarks have dealt only with brass which has been annealed as a final operation. Quite different properties are obtained if the brass is finished in the hard rolled state. These vary with the last anneal and with the amount of rolling work on them after the last anneal.

BOLT AND NUT STANDARDS

Variety of Plow Bolts Simplified and Bolt and Nut Standards Discussed

The reduction of the number of plow bolts from an unknown number to four and the indorsement of standard dimensions for regular carriage bolts were accomplishments of the conference called by the Department of Commerce, Division of Simplified Practice, at the request of the National Association of Farm Implement Manufacturers and held in Washington, Feb. 19 and 20.

Sessions were also devoted to the study of standard dimensions for rough machine bolts and nuts, principally the width across flats of square and hexagonal bolt heads and nuts and their thickness.

The conference, a brief account of which was reported in THE IRON AGE of Feb. 28, was attended by approximately 50 delegates representing manufacturers, distributors, consumers and general interests. The delegates of the National Association of Farm Implement Manufacturers represented the first two groups. Members of the Sectional Committee on the Standardization of Bolt, Nut and Rivet proportions, which was organized and is functioning under the procedure of the American Engineering Standards Committee and is sponsored by the Society of Automotive Engineers and the American Society of Mechanical Engineers, represented the following 20 organizations covering all four groups:

Society of Automotive Engineers, the American Society of Mechanical Engineers, American Electric Railway Association, American Hardware Manufacturers Association, American Supply & Machinery Manufacturers Association, American Railway Association, American Society of Agricultural Engineers, Bridge Builders & Structural Society, Electric Power Club, Master Boiler Makers Association, National Machine Tool Builders' Association, National Association of Stove Manufacturers, Navy Department, Society of Naval Architects and Marine Engineers, the American Boiler Manufacturers Association, the Gas Engine & Farm Power Association, the Railway Car Manufacturers Association, War Department, Associated Manufacturers of Electrical Supplies, and the American Society for Testing Materials.

Before the conference had progressed very far it became evident that the work before it was not limited to merely the elimination of variety and sizes but involved the more difficult question of technical standard-

ization. The form and dimensions of the four plow bolts as prepared and recommended by the National Association of Farm Equipment Manufacturers were approved with slight modifications. These plow bolts are those known as Nos. 3, 4, 6 and 7, bolts Nos. 3, 6, and 7 having round heads and No. 4 having a square head. They have angles under the head of 80, 80, 40 and 60 deg. respectively, and their nominal diameters are 5/16, 3/8, 7/16, 1/2, 9/16, 5/8, 3/4, and in certain cases 7/8 and 1 inch.

The standard dimensions for regular carriage bolts which had been developed by the sectional committee's sub-committee No. 5, were indorsed with slight changes. These standard dimensions refer to the head only and are as follows:

Diameter of Bolt (Inches)	Diameter of Head (Inches)	Height of Head (Inches)	Length of Square (Inches)
1/4	5/16	3/16	3/4
5/16	3/8	1/4	7/8
3/8	1/2	1/4	1
7/16	5/8	1/4	1 1/8
1/2	3/4	1/4	1 1/4
5/8	7/8	1/4	1 5/8
3/4	1	1/4	2
7/8	1 1/8	1/4	2 1/4
1	1 1/4	1/4	2 3/4
	1 1/2	1/4	3
	1 3/4	1/4	3 1/4
	2	1/4	3 1/2
	2 1/4	1/4	3 3/4
	2 1/2	1/4	4
	2 3/4	1/4	4 1/4
	3	1/4	4 1/2
	3 1/4	1/4	4 3/4
	3 1/2	1/4	5
	3 3/4	1/4	5 1/4
	4	1/4	5 1/2
	4 1/4	1/4	5 3/4
	4 1/2	1/4	6
	4 3/4	1/4	6 1/4
	5	1/4	6 1/2
	5 1/4	1/4	6 3/4
	5 1/2	1/4	7
	5 3/4	1/4	7 1/4
	6	1/4	7 1/2
	6 1/4	1/4	7 3/4
	6 1/2	1/4	8
	6 3/4	1/4	8 1/4
	7	1/4	8 1/2
	7 1/4	1/4	8 3/4
	7 1/2	1/4	9
	7 3/4	1/4	9 1/4
	8	1/4	9 1/2
	8 1/4	1/4	9 3/4
	8 1/2	1/4	10
	8 3/4	1/4	10 1/4
	9	1/4	10 1/2
	9 1/4	1/4	10 3/4
	9 1/2	1/4	11
	9 3/4	1/4	11 1/4
	10	1/4	11 1/2
	10 1/4	1/4	11 3/4
	10 1/2	1/4	12
	10 3/4	1/4	12 1/4
	11	1/4	12 1/2
	11 1/4	1/4	12 3/4
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New Use for Refuse Refractory Material

Old Fire Clay Brick Bats Ground Up with a Bond to Form a Highly Refractory Mortar—Cost Reported Low

BY S. F. WALTON*

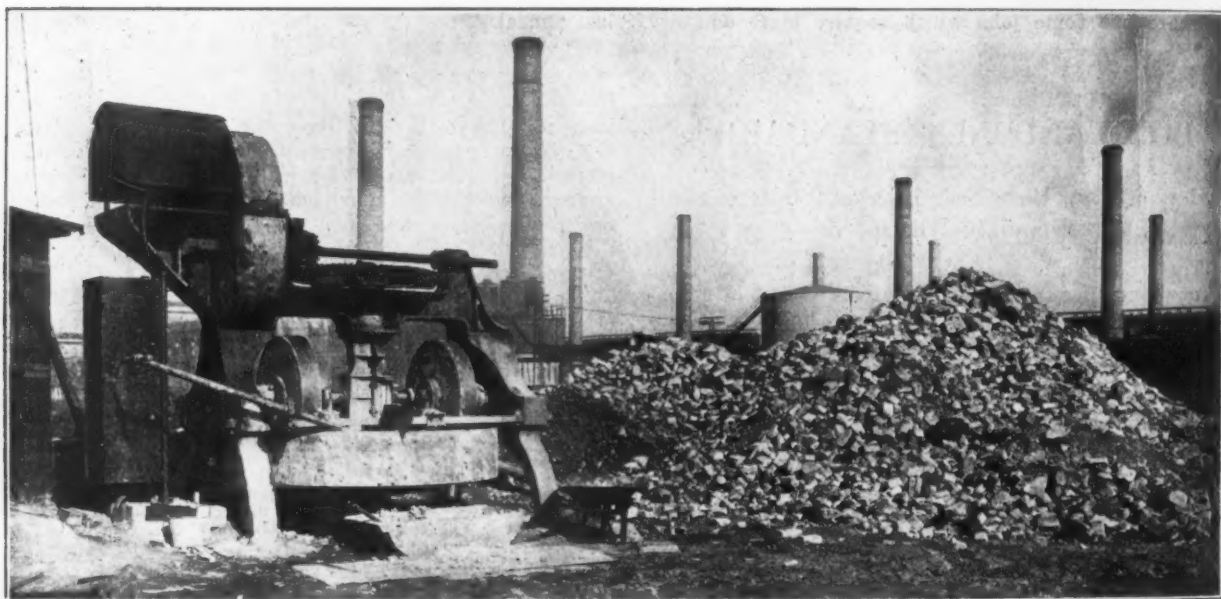
IN steel plants and other industries which are large users of fire brick the refuse pile of broken fire brick from old furnace construction confronts the plant superintendent and engineer with its enormous waste. Their experience tells them that this old fire brick, if it could be utilized, would be better refractory material than they can purchase today for the same money. They are well aware that high-grade fire clay fire brick, containing a high percentage of Pennsylvania flint clay, are still produced in Pennsylvania at a price, but that the tendency, because readily accessible flint clay of high refractoriness is getting scarcer each year, is to reduce the percentage of flint clay and increase the amount of soft clay.

This increase in the use of soft clay, though it may

brick made to withstand such usage are either too expensive to use or do not give an increase of life commensurate with their greater cost.

Use of Special Cements

For some time past another method of attempting to increase fire brick life has been by the use of high-temperature cements, of which there are a number on the market. The cost has been high and the service in many instances has not been up to expectations. These cements are composed of mixtures of calcine or grog (ground fire brick or its equivalent) refractory ores and minerals, silicates and salts, and fire clay as a bond. The mixtures are various; some are shipped dry, others in a wet or moist state. Nearly all of the wet mixed



Waste Fire Brick, Heretofore Thrown Away, Are Now Used. The wet pan mills and grinds the waste fire brick and bond together to any desired consistency and fineness. (All four photographs copyrighted by James A. Faulkner)

not decrease the fusion point of the brick appreciably if at all, will lower the softening point; that is, the brick will deform at a lower temperature than the high-flint brick. Since the old workings, the readily accessible flint clay, are being depleted and the manufacturer must go farther afield, the cost of production is increased and high-grade flint clay fire brick will increase in cost from time to time. Our industries are using an increasing quantity of fire brick each year. All this means, then, either that the flint clay must be used less or that the consumer must pay more for a fire brick containing as high a percentage of flint clay as formerly used.

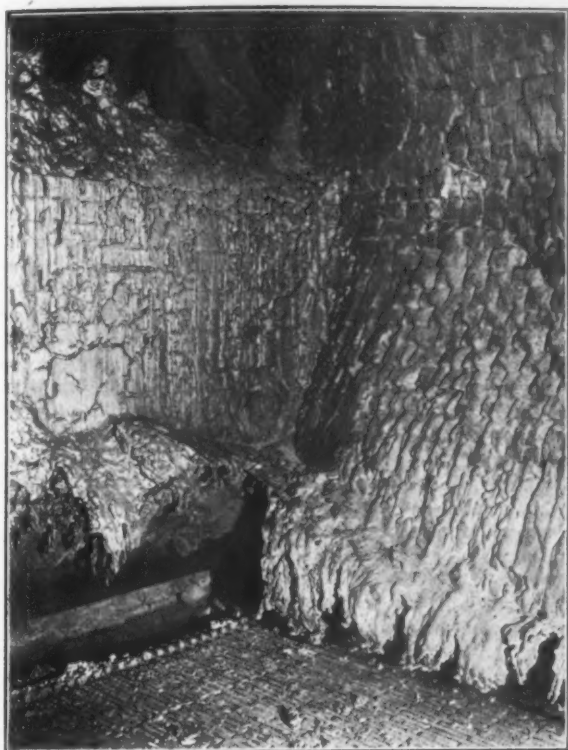
It is known that brick which are protected from direct flame action can be of a lower softening point than brick which are unprotected. In heavy furnace walls the engineer uses second quality brick for backing up the inner wall which comes in contact with the flame. An ideal construction would be one in which the inner wall would furnish as little trouble as the backing up wall. But costs must be kept down and

ready-to-use cements contain silicate of soda or water glass as the material which gives the cement its bonding strength and the ability to harden or air set. The dry mixed cements, which must be kept in metal drums away from moisture, contain portland cement or other salts and silicates of like nature, which give a chemical set when mixed with water.

Laboratory tests and practical experience demonstrate that silicate of soda has a marked deteriorating effect on the refractories of fire clay. Portland cement or other silicates and salts, such as common salt, borax, salts and silicates of lime or potash, also lower the fusion point of fire clay and nearly all refractory ores and minerals. If such salts or silicates are used, either the cements are less refractory than fire clay and fire brick or the refractoriness has been built up by the addition of more refractory ores and minerals, such as chrome ore or zirconia, which are expensive.

Real conservation would be the result if a method could be worked out which would enable the plant superintendent to utilize his waste pile of broken brick. To utilize this waste pile a bond had to be developed which could be produced comparatively cheaply and

*Ceramic engineer, Northern Refractories Co., Ridgway, Pa.



Side and Bridge Walls Over an Illinois Forced Draft Stoker After a Little Over Four Months Service

which would not lower the refractoriness of the calcine or ground brick. To be effective this bond should not depend on silicate of soda or the chemical action of salts and silicates, for its binding action or its air setting qualities, and must be composed of natural products to keep the cost to a minimum. This bond should be one which could be used with equal success with ground fire brick or silica brick. It should be made up dry. It should not set or deteriorate in storage.

After many trials and changes the ceramic department of the Northern Refractories Co. reports a bond which meets most of these stipulations. Any mortar can be made by a suitable mixture of bond and inert



Five Weeks of Severe Service After Repairs Were Made. This wall was replastered before being again put back into service

material, varying the amount of the bond and the kind of inert material for the class of work for which the mortar is to be used.

Using Old Fire Brick

For the engineer who is faced with keeping maintenance costs down and increasing efficiency the following method of utilizing old brick from fire brick construction, and thus conserving natural resources, has been tested out. Used, clean fire brick from furnace walls where the temperature has been higher than 2400 deg. Fahr. make a calcine superior to that made from new brick bats. The method of grinding these old broken brick to a suitable fineness may be one of two; dry grinding the brick to the desired fineness and later adding the bond; or wet grinding, where the grinding and mixing are done at the same time.

A ball mill or similar machine will grind the bats dry and, when the calcine is ground to the fineness desired, the bond can be added to the mill, the mill closed and the final grinding action will mix bond and calcine. This dry mix can be stored in bins or barrels or sacks and mixed with water to the proper consistency when



Side and Bridge Walls After Being Repaired by Applying a Coating of Plaster Made of Ground Fire Brick and Bond. Monolithic baffles in this boiler are made also of ground fire brick and bond

used. The wet method uses a wet pan of the solid bottom muller type. The broken brick and bond are put in the pan and water added while the mass is grinding. The length of time the mass is in the pan grinding determines the fineness. The wet pan method is preferable as a mixing medium, as the kneading action produces a more plastic mortar than the dry mixing and slightly less bond need be used to produce the same bonding action and smoothness.

Grinding and Mixing

In either method of grinding the calcine should all pass a 20-mesh screen at least; if ground so that all will pass a 30-mesh, the mortar will work easier. The mortar makes a ready buttered joint when made up to the proper consistency. The method of using is no different from other mortar. A $\frac{1}{4}$ -in. to $\frac{1}{2}$ -in. joint should be used. To use the mortar as a plaster, practical experience has taught that using a paint coat of the bond before applying the plaster assures a job which does not peel off the wall. If the wall is excessively smooth by fusion of the brick, the addition, to

the water used to temper the bond for the paint coat, of 4 per cent of water glass (silicate of soda) 40 deg. Beaumé is advised.

This paint coat is made by mixing water and bond to a thick creamy consistency and applying this with a brush. The plaster should be applied while the paint coat is still tacky. It adheres strongly and can be built up to $\frac{1}{2}$ in. thick. This plaster stays on in the wet state, dries readily without checking, adheres tenaciously to the wall at any temperature, becoming under heat a hard surface and an integral part of the wall, with a fusion point higher than the fire brick it is used to cover.

The cost of making these mortars is low. Including the cost of the bond delivered to the plant, overhead and labor, a mortar suitable for laying brick and coating the walls of a furnace can be produced for a surprisingly low cost per ton. This cost varies according to quantity produced, method of preparation, whether wet or dry, cost of labor at the plant, and cost of obtaining the broken brick, and is far lower than the cost of high-temperature cements.

Other Uses for the Bond

Many other uses can be found for the bond besides making a mortar and a plaster. A plastic fire brick can be made from a mixture of the bond and coarse ground fire brick. A high-grade silica cement, with the feature of air setting, can be made from a mixture of the bond and old silica brick. It can be used also as a bond for other inert refractory materials, such as carborundum fire sand, chrome ore, etc.

The method evolved is three-fold in its conservation. The mortars are inexpensive to produce, utilizing as they do brick bats from old furnace walls, otherwise refuse material, which must be handled and got rid of, usually on the dump; the mortar and plaster conserve the fire brick walls and arches, making a monolithic effect; new plaster can be applied instead of relaying brick; and the fuel conservation is important as there can be no infiltration of air through cracks, and the layer of plaster gives added insulation value to the furnace walls. For the smaller plant, which cannot afford to install a machine for grinding the brick bats, the same material as the large plants make can be obtained in a ready prepared form.

Large Wage Distribution at Youngstown

The February wage distribution of \$7,194,736 by Youngstown, Ohio, industries established a new monthly record disbursement since the post-war period, exceeding the January payroll by \$754,486 and the February, 1923, disbursement by \$1,083,801. The February distribution compares with \$3,383,142 paid out in February, 1922. Until this time the June, 1923, payroll had been the largest since the peak of the post-war boom, amounting to \$7,165,425.

The first two months of this year Youngstown industries, chiefly iron and steel properties, paid out \$13,634,986 in wages, as compared with \$11,487,933 distributed during the corresponding period in 1923, and \$6,655,130 for the same period in 1922.

The February payroll is considered all the more significant because it is for the short month of the year, and reflects, therefore, the high operating rate which is being maintained in this district.

Detroit Engineers Retained for Citroen Foundry

G. M. Haarst, director general of the Andre Citroen motor works, of Paris, France, with a delegation of associate engineers, recently held a series of conferences in Detroit and has retained James F. Miller & Hurst Corporation, General Motors Building, Detroit, as consulting engineer in connection with the building and equipment of the Citroen foundry to be erected in the suburbs of Paris. Messrs. Miller and Hurst are credited with the River Rouge foundries of the Ford Motor Co.

Ohmer Fare Register Co. Acquires American Taximeter Co.

The Ohmer Fare Register Co., Dayton, Ohio, has acquired the business of the American Taximeter Co., New York. The manufacture of recording devices for use on all kinds of vehicles is to be concentrated at the plant of the Ohmer Fare Register Co. at Dayton. Additional machinery and equipment will be installed and additional clock and instrument builders engaged. Consolidation of the sales and service forces of the two companies will also be effected.

While each of the companies involved in the transaction has catered to the registering and recording device needs of the transportation industry, the class of products manufactured by each has been sufficiently different in purpose and results accomplished to appeal to separate branches of that industry. The acquiring, therefore, of the American Taximeter Co.'s business will enable the Ohmer Fare Register Co. to extend its line of devices manufactured and to reach a field of sale not heretofore covered.

While most of the manufacturing formerly conducted at the New York plant of the American Taximeter Co. will be transferred to Dayton, the office, sales, service and supply distribution headquarters for the eastern division of the Ohmer Fare Register Co. will be retained in the Locomobile Building at 16 West Sixty-first Street at Broadway, New York.

High Honors to a Tin Plate Worker

One of Premier Ramsay MacDonald's recent appointments has aroused much interest in the tin plate industry in this country, as well as in Great Britain. Thomas Griffiths, member of Parliament for Pontypool, has been appointed to the post of Treasurer of the Royal Household.

Thomas Williams, general manager of the Pontypool Tin Plate Works of Partridge, Jones & John Paton, Ltd. (formerly the Pontypool Works, Ltd.), in a letter to Hollinshead N. Taylor, president of N. & G. Taylor Co., tin plate manufacturer, Philadelphia, states that Thomas Griffiths started as a boy at the Melyn Works, Neath, Wales, at a wage of four pence a day; that he rose to the position of roller and afterward came out as an organizer for the British Steel Smelters' Union. He was a divisional officer of the Iron and Steel Trades Confederation before entering Parliament in 1918. He has been a member of the Neath Town Council and associated with the local and national cooperative and Friendly Societies' movements. He has investigated labor conditions in countries other than Great Britain. He has represented Pontypool since 1918, and has been a whip of the Labor party since his entry into the House of Commons. He is a deacon and Sunday school teacher in the Calvinistic Methodist Church at Neath.

In his new appointment Mr. Griffiths succeeds the Right Hon. Colonel George Gibbs, Privy Councillor and son-in-law of Viscount Long.

Under the British Tables of Precedency, plain Tom Griffiths in his new post would outrank at public functions all baronets, sons of viscounts and barons, younger sons of earls, many Knights of the Garter, most knights of other orders, the Lord Chief Justice and the Chancellor of the Exchequer.

Higher Wages at St. Louis

ST. LOUIS, March 11.—A wage increase of 25c. per hour has been granted to four unions in the building industry, making the scale \$1.50 per hour. The unions getting the increase are the ironworkers, cement finishers, hoisting engineers and lathers, about 1000 workers being affected.

The only important building tradesmen that remain on the former basic wage of \$1.25 per hour are the composition roofers, sprinkler fitters and asbestos workers, and they are demanding an increase of 25c. per hour. Two unions—bricklayers and plasterers—receive \$1.75, being the only ones that have exceeded the \$1.50 scale.

New Extras for Cold-Finished Steel Bars

Manufacturers Announce Numerous Changes from the Card
of August, 1919, When Old List and Discount
Method Was Abandoned

PITTSBURGH, March 10.—Effective today, leading manufacturers of cold-finished steel bars and shafting have adopted a new card of extras, superseding one dated Aug. 18, 1919, the date on which the old list and discount method of quoting was abandoned in favor of a pound basis price. The principal changes in the new card as compared with the old one are in the size extras; a new bracketing of the base sizes, which new embrace sizes in rounds from 2¼ to 2⅞ in., as against 2¼ to 3 in. in the former card; slight changes and a clarification of verbiage in the miscellaneous net extras. The change in the base sizes continues the tendency of recent years. From March 15, 1915, until Aug. 18, 1919, the base sizes were 2 to 3 in., and prior to March 15, 1915, for several years they were 1½ to 3 in. Incidentally, the base sizes of hot-rolled bars are ¾ to 3½ in. One other important deviation from the former card is the inclusion in the new one of the standard manufacturing tolerances. These tolerances are to be considered standard for the industry and supplant various standards hitherto followed by the different manufacturers.

The new card is predicated upon the card of extras adopted by the Carnegie Steel Co., dated July 1 last, on hot-rolled bars and which now is observed by all other manufacturers. None of the increases in the new cold-finished steel bar card exceeds those made in the last hot-rolled bar card, while in a number of cases the increase is smaller than in similar sizes of hot-rolled bars and through adjustments there are some cold-finished steel bar size-extras which are smaller than in the former card. The increases in cold-finished flats average about \$5 per ton and are much less than the increases made in the hot-rolled flats extras. In the accompanying table the new extras for flats are indicated by black-faced type. It is commented upon that the new extra of 9/16-in. hexagons is the same in the new and old cards, notwithstanding an increase in the hot-rolled extra of \$3 a ton.

Boxing and burlapping charges have been increased \$5, with a clarification of railroad burlapping requirements. Extras for odd and intermediate sizes, for chamfering, for accuracy, piston rods and roller bearing steel are left unchanged in the new card, with some clearer definitions. The extra of \$10 a ton for guar-

anteed low-sulphur steel in the special and high-carbon open-hearth steel extras is omitted in the new card. Quantity differentials have been increased \$1 to \$3 per ton, in conformity with the change in the hot-rolled bar card. Slight increases are made in the long and short length extras on the lengths from 12 in. to 59 15/16 in. in rounds, squares and hexagons.

The following comparison of net extras for size of rounds, squares and hexagons, according to the old and new cards, will be found of interest:

Net Extras for Size (Per 100 Lb. Net.)		
Rounds		
March 10, 1924 Aug. 18, 1919		
½ to ¾ in.	\$3.00	\$2.25
¾ to 1 in.	2.00	1.50
1 in.	1.25	.90
1 ¼ in.	1.00	.90
1 ½ in.	.90	.90
1 ¾ in.	.70	.60
2 in.	.55	.40
2 ¼ in.	.40	.40
2 ½ in.	.30	.25
2 ¾ in.	.25	.25
3 in.	.15	.15
Base	Base	Base
2 ¼ to 3 in.	.30	.25 (3 ¼ to 3 ¾ in.)
3 ¼ to 3 ¾ in.	.50	.50 (3 ¾ to 4 ¼ in.)
3 ¾ to 4 in.	.80	.80 (4 to 4 ¾ in.)
4 ¼ to 4 ¾ in.	1.00	.90 (4 ¾ to 5 ¼ in.)
4 ¾ to 5 in.	1.25	1.00 (5 to 5 ¾ in.)
5 ¼ to 5 ¾ in.	1.75	1.50 (5 ¾ to 6 ¼ in.)
5 ¾ to 6 in.	2.25	2.00 (6 to 6 ¾ in.)
6 ¼ to 7 in.	3.00	2.50 (6 ¾ to 7 in.)
Squares and Hexagons		
March 10, 1924 Aug. 18, 1919		
½ to ¾ in.	\$5.00	\$3.50
¾ to 1 in.	4.00	3.00
1 in.	2.50	2.00
1 ¼ in.	1.75	1.35
1 ½ in.	1.15	1.00
1 ¾ in.	1.00	1.00
2 in.	.85	1.00
2 ¼ in.	.75	.80
2 ½ in.	.70	.70
2 ¾ in.	.90	.60
3 in.	1.25	1.00
3 ¼ in.	1.50	1.50
3 ¾ in.	2.00	2.00

The complete table of extras provided by the new card will be found on the following pages.

Prices of Cold-Finished Steel Bars from 1912 to 1924

PITTSBURGH, March 10.—In conjunction with the new card of extras for cold-finished steel bars and shafting, effective March 10, THE IRON AGE herewith presents a record of the price changes in the base quotations since 1912. This period witnessed much of the transition in this product from its primary use as shafting into the almost countless uses it has found with the growth and development of the automotive industry. This movement started along about 1908, when the automobile industry began to show signs of the growth it has since achieved. To the automotive industry, with its demand for cap and set screws, spark plugs, ball bearings, pinions, steering rods, etc., more than to any other consuming outlet, does the cold-finished steel bar industry owe its present size. Textile machinery and agricultural implement manufacturers are listed as liberal users of these bars, which also enter into the manufacture of phonographs and typewriters, where steel capable of high finish is necessary. The cold-finished steel bar also enters the oil field in some quantity in the form of drill rods. Shafting, at one time the principal use for these bars, now accounts for only

a small part of the country's production, now estimated at about 800,000 tons annually.

The table of prices gives only the base price and when it changed. There were several times during the period embraced, notably during the war and in the post war boom, when open market prices were considerably higher than those shown, but the figures given are representative of what the bulk of the shipments were priced. From the early days of the industry until March, 1919, it had been the common practice to allow freight to points where the charge did not exceed 15c. per 100 lb. This explains why the quotation of 62 per cent off list in 1912 meant \$1.75, Pittsburgh, and \$1.90 in 1915, on the list and discount method of quoting which was in vogue until Aug. 18, 1919. The list price was \$5 per 100 lb. or \$100 a net ton. A discount of 62 per cent would mean \$38 a ton or \$1.90 per 100 lb. and \$1.75 with freight charges absorbed to the extent of 15c. per 100 lb. Shipments could go a considerable distance in 1912 and 1913 for 15c. per 100 lb., but with rising freight rates it was found necessary to abandon the practice. Beginning with March

STANDARD MANUFACTURING TOLERANCES.
COLD FINISHED STEEL BARS, (BESSEMER AND OPEN HEARTH SCREW STOCK AND SPECIAL OPEN HEARTH SPECIFICATIONS .50% CARBON AND LESS.)

DIAMETER	VARIATION IN SIZE			
	Rounds and Hexagons		Squares	
	Under	Over	Under	Over
Up to 0.3" incl....	0.002"	0	0.0025"	0.0025"
Over 0.3 to 1" incl.	0.003"	0	0.0025"	0.0025"
Over 1 to 2 1/2" incl..	0.004"	0	0.004"	0.004"
Over 2 1/2".....	0.005"	0	0.005"	0.005"

DIAMETER	FLATS	
	Width and Thickness	
	Under	Over
Up to 0.3" incl.....	0.003"	0.003"
Over 0.3 to 1" incl.....	0.003"	0.003"
Over 1 to 2 1/4" incl.....	0.004"	0.004"
Over 2 1/2".....	0.005"	0.005"

SHAFTING
(TURNED AND POLISHED, COLD DRAWN AND COLD ROLLED.)

1" and under, from exact size to not more than .002" under.

1 1/8" to 2" incl., from exact size to not more than .003" under.

2 1/8" to 4" incl., from exact size to not more than .004" under.

4 1/8" to 6" incl., from exact size to not more than .005" under.

15, 1915, the discount became f.o.b. Pittsburgh. On Aug. 18, 1918, the list and discount method of quoting was supplanted by a pound basis, which has since continued.

Cold-Finished Steel Bar Price Changes (Shafting)

	Discount	Equivalent Prices Per 100 Lb. f.o.b. Pittsburgh
Sept. 12, 1912.....	62	\$1.75
May 8, 1913.....	60	1.85
Aug. 13, 1914.....	66	1.55
March 15, 1915.....	70	1.50
June 16, 1915.....	68	1.60
June 28, 1915.....	66	1.70
July 28, 1915.....	65	1.75
Aug. 23, 1915.....	64	1.80
Sept. 23, 1915.....	62	1.90
Oct. 5, 1915.....	60	2.00
Oct. 25, 1915.....	58	2.10
Nov. 5, 1915.....	55	2.25
Nov. 22, 1915.....	52	2.40
Dec. 17, 1915.....	50	2.50
Dec. 30, 1915.....	45	2.75
Feb. 2, 1916.....	42	2.90
Feb. 11, 1916.....	40	3.00
Feb. 22, 1916.....	35	3.25
March 4, 1916.....	30	3.50
March 20, 1916.....	25	3.75
April 4, 1916.....	20	4.00
March 12, 1917.....	15	4.25
June 9, 1917.....	10	4.50
Nov. 6, 1917.....	17	4.15
Jan. 8, 1918.....	17	4.15
Dec. 24, 1918.....	21	3.95
March 22, 1919.....	28	3.60
Aug. 18, 1919, base, per 100 lb.		3.60
Feb. 5, 1920.....		4.00
March, 1920.....		4.25
Nov. 29, 1920.....		3.60
Feb. 23, 1921.....		3.00
April 4, 1921.....		3.10
June 10, 1921.....		3.00
July 6, 1921.....		2.80
Aug. 13, 1921.....		2.50
Sept. 11, 1921.....		2.40
Sept. 29, 1921.....		2.15
Oct. to Dec., 1921.....	Average	2.00
Jan. to April, 1922.....	Average	1.80
April 12, 1922.....		1.90
May 17, 1922.....		2.00
June 14, 1922.....		2.10
Aug. 2, 1922.....		2.25
Sept. 1, 1922.....		2.50
Jan. 25, 1923.....		2.65
Feb. 19, 1923.....		2.80
March 22, 1923.....		3.00
May 1, 1923.....		3.25
Oct. 15, 1923.....		3.15
Nov. 20, 1923.....		2.90
Dec. 1, 1923, to date.....		3.00

Sale of Steel by the Navy

WASHINGTON, March 11.—The Board of Survey, Appraisal and Sale of the Navy will sell approximately 10,000 net tons of steel in various shapes at public auction at the Navy Yard, Mare Island, Cal., on March 19. This is part of the Navy's surplus supply and includes numerous commodities such as plates, shapes, bars, castings, riveters, pipe, etc.

Catalogs for this sale can be obtained from the Supply Officer, Mare Island, Cal., from Michael Tauber & Co., 317 South Market Street, Chicago, or from the Central Sales Office located in the Navy Yard, Washington.

Thomas Sheet Steel Co. Organization

At the organization meeting March 7 of the Thomas Sheet Steel Co., Youngstown, Ohio, Charles S. Thomas was elected chairman of the board of directors and Myron C. Summers president. Mr. Thomas was formerly the chief interest in the DeForest Sheet & Tin Plate Co. of Niles, while Mr. Summers was identified with the Superior Steel Co.

Other officers elected are: Severn P. Ker, Jr., vice-president in charge of sales; Claude R. Thomas, treasurer and Frank Howell secretary. The officers constitute the board of directors.

Mr. Ker is the son of S. P. Ker of Sharon, Pa., president of the Sharon Steel Hoop Co., and was formerly in charge of sales of the Ashtabula Steel Co.,

Ashtabula, Ohio. Mr. Howell has been identified with the Superior Steel Co., American Sheet & Tin Plate Co. and the Inland Steel Co.

The Thomas plant, a 12-mill sheet property at Niles, was purchased by Charles S. Thomas and W. A. Thomas, both of Youngstown, from the Youngstown Sheet & Tube Co. The plant is located in Niles, Ohio. Both of the purchasers are equal partners in the enterprise.

The company is now operating under a nominal capitalization, which will later be increased as needs warrant.

Work of Industrial Police

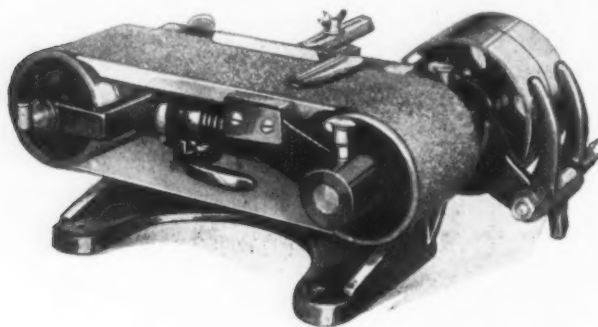
In order to make its industrial police department more efficient, the Youngstown Sheet & Tube Co., Youngstown, rotates the men from time to time so that they become familiar with all parts of the plant. At the East Youngstown and Struthers properties, the Gamewell police call system has been installed. During the war period, the company's force at these two plants consisted of upward of 400 men. The present force is approximately 35 men on a turn at the plants in the Youngstown district.

One of the most important duties of these men is in the interests of safety first. They are required to continually inspect the various departments for unsafe practices and dangerous conditions, and to prevent injury to employees due to locomotives, cranes or motor accidents on the plant roadways.

New Abrasive Band Grinder

A band grinder, known as the Simplex A, for roughing, smoothing or finishing with a straight grain on flat surfaces, has been added to the line of band grinders offered by the Wall Sales Corporation, 96 Warren Street, New York. The machine is designed for use both in machine shop and in mechanical and electrical instrument work.

Tight and loose pulleys are provided as shown, and in addition to the regular quick-change band feature, the machine is equipped with an outboard bearing and movable shifter fork to meet various belt angles. The work table, which is 10¼ in. long x 5 in. wide, is planed level, and the 4-in. band traveling over the table may



be moved to the convenient position by adjusting two thumb screws at the rear of the machine.

The abrasive bands may be changed quickly while the machine is in motion by pulling out the lever, which draws in one pulley, permitting release of the band. A variety of bands in many grits can be furnished, providing for a variety of finishes. The maximum power required is ½ hp. The 5½ in. pulleys run at 1100 r.p.m.

Plans of Belfont Steel & Wire Co.

The Belfont Steel & Wire Co., Ironton, Ohio, formed by a merger of the Belfont Iron Works Co. and the Kelly Nail & Iron Co., has commenced the erection of an addition to its wire and nail mills to take care of the equipment of the Kelly Nail & Iron Co., which is being moved to the plant of the former Belfont Iron Works Co. The plans of the Belfont Steel & Wire Co. include the erection of an open-hearth plant and the establishment of a billet and wire mill on the site of the present Kelly nail mills. A pig casting machine at Sarah furnace is also contemplated. Plans are now being made for blowing in this furnace on Bessemer iron for the company's own use. It is expected that construction work on the units of the plant will be commenced this summer.

General Signal Co. Receives Large Orders

The General Railway Signal Co., Rochester, N. Y., has profited largely from recent orders of American railroads for automatic train control systems. The New York Central Railroad has just ordered from this company the equipment for an initial installation of its system of continuous automatic control. The General Railway Signal Co. has also received similar orders from seven other railroads, among which are the Atlantic Coast Line, Southern, Lehigh Valley, Delaware & Hudson, Chicago & North Western and the Buffalo, Rochester & Pittsburgh. It has on hand at present orders for \$1,500,000 worth of equipment, and faces the prospect of continued prosperity for several years at least, as the Interstate Commerce Commission has ordered about 50 railroads to install automatic control equipment.

The transfer of the signaling business of the Federal Signal Co., Albany, N. Y., to the plant of the General Railway Signal Co. at Rochester is now under way, the General company having acquired the Federal company some months ago. The Albany plant will be

operated by the G. R. S. Products, Inc., owned and controlled by the General Railway Signal Co., and will make clothes-washing and dish-washing machines, this business being transferred from the Rochester plant to Albany. The G. R. S. Products, Inc., has also taken over the business of the Cyclometer Corporation, which manufactures the Evans motorcycle.

Bock Bearings Co. Reorganized

The Bock Bearings Co., Toledo, Ohio, has been reorganized and a number of Cleveland men have become affiliated with the organization. Maynard H. Murch, of the Maynard H. Murch Co., investment security dealer, is the new president and C. O. Steinbicker was elected secretary and treasurer. Robt E. Clingan, Toledo, was reelected vice-president and continues as general manager. The board of directors was increased from seven to nine members. Three old members, W. E. Bock, Toledo; R. B. Wallace and Maynard H. Murch, Cleveland, were reelected and the following new members were added: W. S. Quinlan, Maynard H. Murch Co.; W. G. Mather, president Cleveland Cliffs Iron Co.; F. F. Prentiss, vice-president Cleveland Twist Drill Co.; John A. Kling, chairman Kelly Island Lime & Transport Co.; George E. Randles, president Foote-Burt Co., all of Cleveland, and R. E. Clingan. An executive committee was appointed consisting of Messrs. Clingan, Randles and Quinlan. The Standard Parts Co., Cleveland, now in receivership, held 11,695 shares of common stock of the Bock Bearing Co., which the preferred stock holders of the latter company have now purchased. With 305 shares of common stock held in the treasury the company has a capital stock of 12,000 shares of no par common stock with a valuation of \$60,000 and \$337,200 in preferred stock. In addition to buying back the common stock the Bock stock holders also purchased property adjoining the Bock plants and patents that are said to have cost the Standard Parts Co. \$379,000. The Bock company has a surplus of \$501,582 and its ratio of current assets to current liabilities is more than 2 to 1.

Moore Centrifugal Pumps Improved

A new centrifugal pump, two outstanding features of which are the use of an improved rubber sealing ring on the impeller between the suction and discharge chambers, and the use of a metal graphite packing ring in the packing glands, instead of the ordinary flax packing, has been placed on the market by the Moore Steam Turbine Corporation, Wellsville, N. Y.

The metal graphite packing rings rest lightly upon the revolving shaft and there is no binding effect to retard rotation. The new packing ring is said to be in no way affected by hot or cold water, and once it is properly fitted leaking is reduced to a minimum. The life of the packing is claimed to be practically unlimited when the shaft runs without eccentricity and the shop test efficiency of the pump to be always maintained in service.

The pumps are horizontally split, closely balanced and provided with brass protected chrome-nickel steel shafts. They are built single and multistage, for motor, turbine or belt drive.

The recent report of the examiner of the Interstate Commerce Commission against the proposal of the railroads to raise the combination rate on iron and steel from Pittsburgh to Cleveland and other northern Ohio points will mean that the present combination rate of 19c. from Pittsburgh to Cleveland, instead of the regular through rate of 21.5c., will continue in effect, providing the commission sustains the report of its examiner. The combination rate was made possible by a 9½c. rate between Pittsburgh and Youngstown and the same rate between Youngstown and Cleveland. The matter will come up for oral hearing before the commission April 1. Various other points including Buffalo and Wheeling are affected by the decision.

Commission Divided as Basing Case Ends

Final Evidence as to Pittsburgh Plus Controversy Submitted

—Date for Briefs Extended—Commissioner Thompson

Tells of Failure to Agree

WASHINGTON, March 11.—Final evidence in the Pittsburgh base hearing was submitted before Examiner J. W. Bennett of the Federal Trade Commission here last Friday. It comprised exhibits submitted by both Attorney K. E. Steinhauer of the commission and Attorney W. W. Corlett of the United States Steel Corporation, based on previous evidence recorded in the elaborate proceeding.

At the request of Mr. Corlett, the commission has granted extended time for the submission of briefs and as a result the previous dates fixed have been moved forward. The request was made by Mr. Corlett in order that he might have ample time to check up exhibits of the commission.

During the sur-rebuttal hearing of the Steel Corporation, a legalistic turn to the hearing developed and has led to the belief that interpretation of one of the provisions under which the complaint was issued will be an important factor in deciding the case deals with price discrimination. The other provision under which the complaint was issued is Section 5 of the Federal Trade Commission act relating to unfair methods of competition. Mr. Corlett, speaking of the former provision, while Mr. Steinhauer was on the stand for a few moments as a witness, said that it is the contention of the Steel Corporation that the price discrimination alleged refers to so-called discrimination as the result of the Pittsburgh-base practice in the prices of steel to customers in one territory as against customers in another territory and not to customers in a given single territory. Attorney Steinhauer said that that was not the construction placed by the commission on Section 2, but that it was broader in its scope and covered purchasers generally.

Under the new schedule arranged in the case by the commission, the report of the examiner is to be filed by March 30, the brief of the commission is to be filed by May 22, the brief of the Steel Corporation is to be filed by June 9 and final argument before the commission was set for June 23.

The Steel Corporation withdrew exhibits showing special contracts based on tonnage to which objection had been raised by Mr. Steinhauer. It was maintained by Mr. Steinhauer that there was no way of telling what the tonnages were and at what prices they were sold. He declared that the contracts did show first quarter sales and prices at certain dates but not beyond that period. The point was made that the comparison by the commission was by contract sales and not by weighted tonnage, although each side assumed the basis of the other in making criticisms.

Chicago and Pittsburgh Production Compared

Intended to combat exhibits of the commission, Attorney Corlett submitted documentary evidence regarding relative production and consumption of steel in the Chicago and Pittsburgh districts. The exhibits were prepared and identified by C. R. Moffat, in charge of the Bureau of Statistics, Illinois Steel Co. Attorney Steinhauer objected to most of the exhibits on the grounds that they were based on assumption and did not give preceding or subsequent figures by which comparison could be made. Objection was made particularly to figures showing consumption of steel rails over a period of 14 years. It was maintained by Mr. Steinhauer that the Steel Corporation had violated a previous rule for showing averages for five years. He contended that the corporation went back to the years 1910 and 1911 because of the heavy rail production during that period. The result, according to Mr. Steinhauer, was that the figures showed a heavier output than a five-year average would show.

The Steel Corporation also submitted voluminous exhibits which were a recapitulation of previous evidence relating to sales, contracts and prices, some of them comparing f.o.b. Pittsburgh quotations and their equivalents on f.o.b. delivered and Chicago bases. There also was submitted a statement showing sales by the Illinois Steel Co. to implement manufacturers during the period 1908-1915. The purpose of this exhibit was to show the various dates of sales and the Pittsburgh price equivalents, in an effort to offset the contention of the commission that there was ever a period when definite price concessions were given to implement makers.

Other exhibits also were placed in the record giving sales of the Illinois Steel Co., intended to show variations from prices given in THE IRON AGE. As he had done previously, Mr. Steinhauer objected to these exhibits, claiming that there had been lumped in the tonnage extras and specials on which THE IRON AGE does not quote. Because of this he maintained that the exhibit was not comparable with THE IRON AGE quotations, and was, therefore, worthless. Exhibits were also submitted on prices, contracts, etc., by A. V. Winter, head of the pricing and invoicing department of the Illinois Steel Co., and by Hugh E. White, statistician for the commission.

Commission Divided

Almost simultaneously with the close of the hearings in the case it was revealed that the commission is still divided on the issue involved. This was disclosed in an address made here last Thursday before the National Popular Government League by Chairman Huston Thompson of the commission, who voted for a complaint. In the course of his remarks, intended to explain the work of the commission, he touched on the Pittsburgh base case as follows:

"Now we have what is called Section 5, and under Section 5 comes the tremendously important cases that are before the Federal Trade Commission. We have the case which involves what is known as the Pittsburgh base plus. In that case testimony is now being taken. That case will, either one way or another, affect a great many people. I am not contending for or against either position. The commission itself is divided on the case, and after a severe and constant struggle it continues to divide. The fact of the proposition, or the face of the proposition, is this: A certain price is fixed in Pittsburgh on steel per ton. Companies having plants in Pittsburgh also have them in Chicago, Duluth and Birmingham. Although the price at Pittsburgh is \$50, the same company adds the cost of hauling a ton of freight from Pittsburgh to Chicago to that price to the man who may be next door to that plant when he drives his wagon up to get his rolled steel. The contention on the part of the Government is that that is handicapping the whole Middle West district so that when it attempts to come back East, with the \$7.50, as they call it, imaginary freights on top of this price of steel, they cannot get into the Pittsburgh market, or the half-way market either. On the other hand, the proponents of this position say that the Pittsburgh district produces more steel than any other district, that the Chicago district does not produce a sufficient amount of rolled steel, and hence that the last ton of steel produced by the Pittsburgh district determines the price, and therein they say that the law of supply and demand is satisfied. That is the issue. In that case we have 18,000 pages of testimony. We have approximately 13,000 exhibits, so that we have an enormous record and we have gone absolutely to the bottom of that situation."

ANNEALING TOOL STEEL

Condition of the Steel and Time Required— Effect of Small Percentage of Chromium

The annealing of tool steel was the subject of an address by J. V. Emmons, metallurgist Cleveland Twist Drill Co., Cleveland, before the Chicago chapter American Society for Steel Treating, Feb. 14. Mr. Emmons' remarks were confined to carbon tool steel with not more than one per cent of any alloying element. He outlined three principal reasons for annealing tool steel: To secure the highest degree of machineability, to place the steel in the proper condition to harden successfully, and to complete the refinement of the grain size and thus secure maximum cutting quality.

The condition of the steel before annealing has a vital effect upon the results of the process. The composition should be known in order to determine the location of the annealing temperature. The structure of the steel as left by the previous forging or rolling treatments also affects the location of the proper annealing temperature. The annealing temperatures range from 1375 deg. Fahr. in the case of properly forged steel or 0.80 per cent carbon to 1550 deg. Fahr. in the case of high-carbon steel with a large grain size. Extreme grain size or segregation sometimes requires a normalizing treatment before annealing. Too low a heat in annealing leaves the coarse hard structure from the previous heat treatments unbroken. Too high an annealing heat produces a coarser and harder structure than was originally present.

The time required at the annealing heat, in order to produce the desired results, is usually quite short. The transferring of the heat into large masses of steel without overheating the more exposed portions requires considerable lengths of time. This is especially true

when the steel is packed in non-conducting materials.

The refinement of grain size desired for proper hardening and satisfactory cutting quality is accomplished while the steel is at the annealing heat. The machineability is controlled principally by the rate of cooling. Rapid rates of cooling produce higher hardnesses and structures known as sorbitic and pearlitic. Steel so annealed is sometimes used for such operations as thread cutting, backing off and milling. Cooling more slowly by such means as burying in heat-insulating material produces softer steel with the pearlite partially broken up. This is a satisfactory condition for most machining operations. Extremely slow cooling in the furnace produces a very soft steel which is desirable for turning, swaging, cold-forming, etc. In this case, the pearlite is entirely broken up into ferrite and spheroidized cementite.

Special care is necessary, during the annealing process, to prevent the formation of a decarburized bark or skin on the steel. To prevent this it is necessary to protect the steel from oxidizing conditions while it is heated above its critical point. Care is also necessary when using the slower rates of cooling to prevent the formation of graphite or black center in the steel. The presence of any considerable amount of graphite seriously damages the steel. In order to prevent it, the steel must not be held for any considerable length of time at or just below its critical point. The formation of graphite is also prevented by the addition of small amounts of chromium.

In considering the advisability of using special annealing treatments the question of cost enters quite largely. Where steel is being used in small quantities it is, of course, not advisable to install expensive annealing equipment. It has been the experience of the Cleveland Twist Drill Co. that annealing control is necessary to insure uniformity and the highest cutting quality in its tools.

Machinery Club Favors Mellon Plan

The Machinery Club, 50 Church Street, New York, whose members are engaged in the machinery, iron and steel and allied industries, has announced the result of a post card poll of its members on the Mellon tax reduction plan. Of the 885 votes cast, 880 voted in favor of the Mellon plan, 2 voted "no," and there were 3 qualified votes. The result of the vote has been sent to William R. Green, chairman of the Ways and Means Committee of the House of Representatives, Washington.

Boston Branch National Metal Trades Association Annual Meeting

Approximately 100 members and guests of the Boston branch, National Metal Trades Association, attended the nineteenth annual meeting held Wednesday, March 5, at Young's Hotel, Boston. Wolcott Remington, Thomson Electric Welding Co., Lynn, was elected president to succeed George P. Aborn, Worthington Pump and Machinery Corporation, Cambridge, Mass. J. R. Kinney, The Kinney Mfg. Co., Jamaica Plain, Boston, was made vice-president, succeeding Mr. Remington. W. S. Kemp, Holtzer-Cabot Electric Co., Jamaica Plain, was reelected treasurer.

Fred F. Stockwell, Barbour-Stockwell Co., Cambridge; Martin B. McLauthlin, George T. McLauthlin Co., Boston; Mr. Aborn; and Ralph E. Thompson, Gillette Safety Razor Co., South Boston, were made honorary members of the association. Theodore W. Little, Walworth Mfg. Co., Boston; Thomas Officer, Sullivan Machinery Co., Claremont, N. H.; and James Russell, James Russell Boiler Works, Dorchester, Boston, were made members of the executive committee to serve for three years.

Mr. Aborn, retiring president, presided at the dinner and introduced Mr. Remington as toastmaster. Fred R. Marvin, associate editor New York *Com-*

mercial, New York, and L. W. Fischer, national secretary National Metal Trades Association, Chicago, were the guests of the evening. Mr. Fischer confined his remarks to a review of the accomplishments of the association during the past year and the growth in membership.

Mr. Marvin spoke on the menace of radicalism and stated that in his opinion the present oil investigation at Washington is based on a desire of the radical element to retaliate for the injunction against a strike obtained by Attorney-General Harry M. Daugherty during the last railroad labor crisis.

Steel Club Holds Fifth Annual Dinner

The Steel Club of Philadelphia, a social organization of district sales managers of steel companies soliciting business in that district, held its fifth annual dinner Friday evening, March 7, at the Bellevue-Stratford Hotel, Philadelphia, with an attendance of more than 200, including guests. Harry G. Uphouse, Philadelphia district sales manager of the Donner Steel Co., Buffalo, president of the Steel Club, was toastmaster. The Rev. Warren Giles, East Orange, N. J., and Major Charles D. Morris, the latter a newspaper correspondent who has spent several years in the Near East, were the principal speakers.

Mr. Uphouse commented on the growing popularity of the Steel Club's annual dinners. Some of the guests at last Friday night's affair traveled from cities several hundred miles distant.

The Gas Products Association, 140 South Dearborn Street, Chicago, a trade organization composed of the producers of oxygen, hydrogen and acetylene compressed gases and welding and cutting apparatus manufacturers, has prepared rules for the safe handling of cylinders containing compressed oxygen, hydrogen and acetylene.

Our Iron Ore Imports Are Increasing

Eastern Territory Turning to Foreign Ore Because of High Rail Rates

—Trans-Atlantic Shipments Mainly Ballast, but Latin

American Trade May Expand Largely

BY PAUL M. TYLER*

PRODUCING, as it does, substantially more than one-half the world's output of iron ore and possessing some 12,000 million out of the 90,000 million tons estimated as the world's "known" total resources of this material, the United States is not ordinarily considered as having to look to other nations to help keep her pig iron furnaces in blast. In extreme necessity, this country could unquestionably be self-supporting in this respect; if a cordon of hostile ships blockaded our coasts, we could keep on making steel and iron in ever-increasing quantity, although we might have trouble in getting all the low phosphorus ore we should need.

Wartime necessity, however, is not commercial expediency; hence foreign ore is a distinctly important factor in the domestic situation and the overseas trade is rapidly assuming even more significant proportions. During the last spring and summer more foreign ore was being imported than ever before in the history of pig iron production in the United States. In addition to the imports of the Bethlehem Steel Corporation, which is to a considerable extent dependent upon imports from its own mines in Chile and Cuba, there has been an exceptionally heavy movement to other plants located in the Eastern territory.

During the past year 2,786,430 tons of foreign ore were imported. This compares with 1,140,463 tons of imports in 1922 and only 315,768 tons in 1921. Just before the outbreak of the European war imports were increasing rapidly, but this pre-war movement was attributed chiefly to a sudden increase in Cuban shipments and was accompanied by a real reduction in shipments from across the Atlantic. But this year trans-Atlantic shipments, with the sole exception of those from Spain, are much greater than ever before and the total imports for the 12 months exceeded the previous record of 2,594,770 tons set up in 1913.

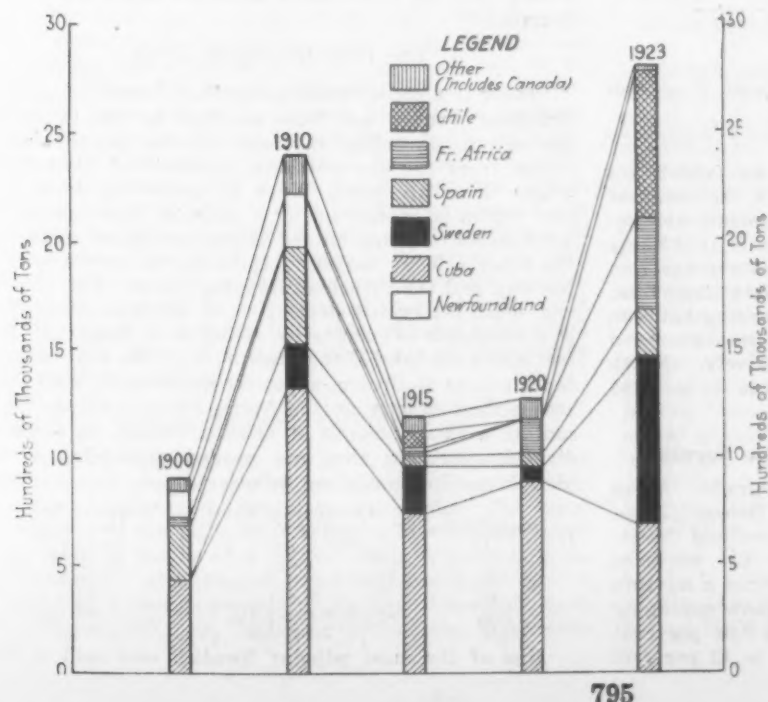
Compared with the huge output of domestic mines (which, when spurred to their maximum activity, pro-

duced more than 75 million tons in 1916 and again in 1917) the import figures—although increasing—do not loom very large. But even though the tonnage figures may seem small, foreign ore has already become a vital element in the economy of many furnaces along the Atlantic seaboard and, owing to a combination of circumstances, is rapidly ousting lake ore from an important consuming area and winning business away from the Appalachian magnetite miners. Nearly all the furnaces in eastern Pennsylvania and Virginia are using higher proportions of foreign ore in their mixtures and some of them are employing it almost exclusively.

Cheapness a Chief Factor

The chief cause for this growing use of ore from overseas is its cheapness. Lake Superior ores compare favorably with those produced in other parts of the world as regards extent of deposits, quality and iron tenor, and cost of mining. Despite the cheapness of water transportation down the lakes and the most advanced appliances for loading and unloading, one-third the cost of this ore at Lake Erie ports represents freight, and, when shipped to the Atlantic Coast, its cost is so further enhanced as to be almost prohibitive. As compared with the so-called normal of 1914, internal transport rates are still approximately 60 per cent higher than pre-war.

Ocean freights, on the other hand, while they soared to unprecedented heights during the war and again during the wild scramble for shipping space that characterized the trade boom in 1920, have now dropped to their old levels, or below. Rather than tie up their ships with the idle fleets that clutter the backwaters of harbors throughout the world, shipping concerns will often accept cargo that scarcely pays the cost of handling. Furthermore, ore is ideal ballast material and many ships that come to this country to get our food-stuffs, machinery and manufactured products bring ore as return cargo. A rather anomalous trade has also developed the last year or so, when vessels bringing Swedish ore to Philadelphia or Baltimore have coasted



Changes in Source of United States Iron Ore Imports as Shown by Figures of Five Representative Years During a Quarter Century. Cuba, Sweden and Chile were the chief shippers in 1923, but two of them were scarcely recognized in 1900. Imports from Newfoundland, once of high importance, have almost disappeared, their place being taken by African ores. Sweden now occupies a much more prominent place in the diagram than formerly, both in tonnage and in percentage of the total imports

*Consulting metallurgist; formerly chief of metals division, United States Tariff Commission.

up to Newfoundland to take on a load of Wabana ore for German blast furnaces.

With domestic freights advanced and ocean rates back to pre-war, the situation obviously favors import business. It is really as cheap to take ore from many European ports, and discharge it into cars at Philadelphia or other well-equipped American ports, as it is to move ore from the Minnesota ranges to lower lake ports. The rail freight from Philadelphia to Eastern furnaces is generally about \$1 and sometimes as low as 80c. a ton, whereas it costs a trifle over \$2 to ship ore from Buffalo or Conneaut.

Low-Phosphorus Ore Needed

Cheapness is not the only factor in the growing use of foreign ores. Domestic consumption of low-phosphorus iron is estimated at 500,000 tons annually, requiring about 1,000,000 tons of ore with less than 0.015 per cent of phosphorus. Much of this must be imported and practically all the low-phosphorus ore low in copper must come from abroad. There are fairly large, though closely held, deposits of low-phosphorus ore at Cornwall and one or two other places in Pennsylvania, but most of the known and accessible deposits of this kind of ore have been exhausted.

Pyrites cinder (principally from imported pyrites) is an important low-phosphorus material, but both cinder and Cornwall ore contain too much copper to enable them to be used for making iron of certain rigorous specifications. Imported ore is thus necessary in many cases. The nickel and chromium contents of certain Cuban ores similarly recommend them for the manufacture of structural steel. Quality is again a factor leading to the importation of Swedish ores, which are high in iron and have physical properties that make them desirable as a means of increasing furnace capacity and reducing fuel consumption.

As may be seen from the following table, by far the greater part of the imported ore up to the current year has been coming from Cuba, which country has contributed fully one-half the total imports. During the last few years, however, imports from Cuba have declined, owing to the larger use of Chilean ore by the Bethlehem Steel Corporation, which has important mines in both countries.

United States Imports of Iron Ore by Countries for Typical Years—Gross Tons

Source	1900	1910*	1915*	1920	1923
Cuba	431,265	1,327,212	755,901	889,852	692,979
Sweden	(a)	188,621	201,989	63,841	749,765
Spain	253,694	446,015	67,930	69,915	214,891
French Africa	20,000	(a)	6,500	158,879	(a)
Newfoundland	140,535	248,481	17,500	(a)	(a)
Canada	5,588	32,205	43,315	34,084	24,710
Chile	(a)	(a)	97,450	(a)	(a)
Other Countries	46,749	139,142	5,492	51,945	1,086,085 (b)
Total	897,831	2,381,676	1,196,077	1,268,536	2,768,430

*Fiscal years ending June 30.

(a) Included in "Other countries."

(b) About 60 per cent from Chile and almost 40 per cent from Africa.

According to the statistical valuations (which are purely nominal, since ore is free of duty), the cheapest ore, as based on the price at port of shipment, was imported from Spain; the average appraisal in 1923 being under \$1.70 a ton. On account of its high average iron content and its freedom from objectionable impurities, Chilean ore was the most expensive, averaging between \$4 and \$5 a ton. Cuban and Swedish ores averaged roughly \$4 and \$3.55 per ton, respectively. North African was a little cheaper, ranging from \$3 to \$3.85 in various shipments.

Cuba Has Large and Easily Accessible Supplies

Cuban ores are mostly of Bessemer grade. About two-thirds of the output comes from the Daiquiri, Jurugua and Cuero mines on the southern coast and the remainder from the Mayari mines near the northern coast. The former group of mines produces a mixture of hematite and magnetite, rich in iron (now averaging 58 to 59 per cent Fe) and with around 0.02 per cent phosphorus, but somewhat silicious (10 to 12 per cent

SiO₂). The Mayari is a brown ore carrying as much as 35 per cent of water, but all export ore is nodulized at Fenton on Nipe Bay to a product that runs uniformly about 55 per cent iron. Although formerly considered refractory on account of the alumina, which often runs up to 15 per cent, Mayari ore is now treated successfully. It is especially valuable because it always contains at least ½ per cent nickel and about 1.5 per cent of chromium. Sometimes this ore assays as much as 1.5 per cent of nickel.

Cuba's resources are enormous, being estimated variously between 2000 million and 3500 million tons, with potential reserves totalling perhaps 12,000 million tons. Most of this is brown ore, as the hematite-magnetite beds are not extensive and have been worked steadily since 1884. The brown ore, however, is found in huge residual accumulations, easily worked by steam shovels, and is mostly near the coast. For geographical reasons, the logical market for Cuban ore is the Atlantic seaboard of the United States. Before the war, the sea-freight to Baltimore was only 85c. a ton, including stevedore charges, and Cuban sinter was delivered at that port at a cost of \$2.50 a ton, or less than 5c. per unit. The principal producing mines are owned by subsidiaries of the Bethlehem Steel Corporation, but other American interests have secured extensive ore holdings which are being held in reserve.

Rapid Increase in Imports from Sweden

Sweden has suddenly become the largest source of supply of imported ore, a distinction formerly held by Cuba. The imports from Sweden this year constitute almost one-third the total from all countries and are nearly double the previous Swedish record of 366,940 tons in 1914. Twenty years ago no Swedish ore was used in the United States and, in fact, although Sweden has been famous for centuries as a producer of iron, it was not until the development of the basic process for making steel, which provided an outlet for her large resources of phosphoric ores, that Sweden came into prominence as a source of ore supply for other nations. The extensive evergreen forests of the Scandinavian peninsula constitute an ample reserve of fuel that can be used with carefully selected ores for the manufacture of high quality iron in the numerous small blast furnaces; hence ore of Bessemer grade is now conserved for use at home in the manufacture of charcoal iron.

Including ore retained for home consumption, the Swedish output commonly amounts to about 6 or 7 million tons annually, the maximum having been 7,355,428 tons in 1913. Since this ore averages 68 per cent Fe, the production is at the rate of more than 4,500,000 tons of iron yearly, an annual contribution that is exceeded only by the United States, France and Great Britain.

Ore from the Arctic Circle

There is a considerable production from Central and Southern Sweden but from one-half to two-thirds of the output—including the bulk of the export ore—comes from the far northern province of Norbotten, where there are some 10 or 15 producing localities. The region is opened up by a railroad that runs eastward down to Lelea on the Baltic and down again on the other side to Narvik, a fjord on the west coast of Norway and the principal shipping point. The largest and most celebrated deposit is at Kärnavaara; this is a mountain of magnetite rising to a height of 300 feet above the lake of the same name. The next largest deposit is at Gellivare, about 50 miles south and situated almost exactly on the Arctic Circle. All the ores contain a small amount of apatite, usually in a finely divided condition; they are graded according to the phosphorus-iron ratio, as follows:

Designation	Phosphorus Limit, Per Cent	Average Iron, Per Cent
A	0.025	69 to 70
B	0.05	69 to 70
C ₁	0.3	67 to 68
C ₂	0.8	66
D	0.8 to 2.5	62
G	2.0 to 4.5	58

One of the most popular Swedish ores sold in the

United States (Captain) has the following typical analysis:

	Per Cent		Per Cent
Iron (Fe)	69 to 70	CaO	1.40
SiO ₂	3	MgO	0.67
Al ₂ O ₃	0.4	P	0.20
MnO	0.18	S	0.009

Most of the Swedish ores are carefully prepared for shipment and are in good mechanical condition as well as uniform in analysis. Although they may contain as much as 50 per cent of fines, there is little dust. Crushing is done in two stages, preliminary breaking at the mine being followed by a second crushing before loading into the vessel. While Swedish ore has been used alone, even in the United States, where a considerable amount of mill cinder was being worked up, the usual mixture includes about 50 per cent Swedish along with domestic magnetite and perhaps a little Lake ore, such additions being desirable to furnish slag-making elements as well as to modify the character of the iron.

Ocean freight is about 11s. (\$2.40) a ton, including the cost of discharging, thus making the price of Swedish ore on the Atlantic seaboard around 10½c. a unit. This is about 3c. a unit more than it was last spring when, owing to the complete absence of German demand, there was a brief slump in the Swedish market. Prior to the war, the price at the mines was about 6 Swedish crowns or about \$1.50. Nearly two-thirds of the exports then went to Germany and the remainder mostly to Great Britain, although some Swedish ore was used in Belgium and France, mainly for adjusting the phosphorus.

Actual reserves of ore in Sweden are at least 750 million tons, or more than enough to maintain present production for 100 years. "Potential" reserves are estimated at twice that amount.

Spanish Trade Fluctuates

Spain has been shipping ore to the United States for 30 years, but it has been a fluctuating sort of trade. The maximum exports to this country were 446,015 tons in the fiscal year 1910. Two years later, although our imports from other countries were well maintained, Spain supplied us only 65,886 tons.

While not so rich in iron as the export ore from Sweden, Spain's ores are mostly of Bessemer grade and are therefore more acceptable in many parts of the world, especially in Europe, where most of the deposits are phosphoric. Almost one-half the iron made in Great Britain is derived from Spanish ores and important tonnages of these ores are needed to supplement local supplies of low grade ores in France and Germany. Smaller quantities are shipped to almost every iron-making country in the world, thus making Spanish ores more widely distributed than those of any other nation.

While quality is one reason for the almost universal use of Spanish ore, the strategic location of the deposits is of almost equal importance. The mines are all close to the sea and situated at an elevation of 1500 ft. or more, so that the ore travels downhill to the docks. Most of them are worked opencut but, since they are typically small and situated on steep mountain sides, they must ordinarily be worked by hand and the output per man averages only about one ton per day; hence, despite wages of only 7 or 8 pesetas, or about \$1 at present exchange, production costs are higher than in Minnesota. The chief advantage, therefore, is the short gravity haul to shipping points, which enables Spanish ore easily to be placed on the docks at a cost of only 20 to 25 pesetas (less than \$3) per ton—which is probably cheaper than any other ore of like quality delivered at seaboard.

Spanish Shipping Facilities Poor

Loading facilities are not good, however, except at Bilbao, and even at that important port they are only fair, as measured by American standards. The usual system is to run railroad cars onto a low trestle, dumping them by means of a tippie. There is practically no provision for storage and, since only one hatch can be loaded at a time, a vessel usually has to wait six days to take on 5000 tons. Including discharging, this means

a delay of fully ten days in addition to actual sailing time between Spain and the United States. Another deterrent to trade is the system of export taxes and port dues, often totalling as much as 2 shillings a ton.

Owing to the spasmodic character of the American trade, most of the ore is shipped as ballast, but even the trade with England, which is remarkably steady, is not well organized. Although many British iron-making firms own mines in Spain, they generally charter their bottoms in the open freight market. The ships are not designed as ore-carriers and are mostly small, cargoes ranging from 1500 to 4000 tons. Rates are kept down, however, by the regular backhaul of coal to France and Spain.

Freight rates to the United States are now about the same as pre-war, or approximately 8s. (\$1.75) a ton for full cargoes. The American price varies with competition but at present is between 10 and 11c. a unit, according to quality, as compared with about 7c. f.o.b. Philadelphia in 1913. The real barometer of the Spanish ore trade is the quotation for Rubio, a brown hematite, at Middlesbrough (Cleveland) on the River Tees in England. During the last twelve months this price, which includes freight from Spain, has been fairly steady around 23s. a ton, or say 10 to 10½c. a unit. Rubio is the aristocrat of Spanish ores, however, and is mostly consumed in England. Other grades are sold on contract, arrived at by bargaining between seller and buyer; while always cheaper than Rubio, there is no standard scale of differentials.

North African Imports Mostly Low in Phosphorus and Copper

Both French Africa and Morocco are fast becoming important sources of American imports, although, like Spain, they send the bulk of their output to England and Germany. Ore reserves in Northern Africa are known to exceed 150 million tons and are being extended as development progresses.

All grades of lake ores can be duplicated in North Africa but the American trade has been confined principally to low phosphorus ore, most of it free from copper. Such ore has been quoted at around 11c. a unit delivered in this country and a good grade, low in phosphorus but containing a little copper, can be had for 10¼c. A rather popular ore from these regions is Ouenza, which is not only low phosphorus but contains lime, which leads to its use as a mixture with the silicious Wabana ores. Owing to better port facilities, freights from North African ports—Bona, Hornillo, Algiers, Bougie, Tinezrit, Melilla (Spanish Morocco) and Garrucha—are from ½ to 1 shilling cheaper to the United States or to Great Britain than they are from Spanish ports. A typical Philadelphia rate is 7s. 9d., or about \$1.70, which as usual includes the cost of discharging. Recent English freights are under 7s.

Newfoundland Ore Abundant

Canada imports ore from this country and, except for a small over-the-border trade and long rail shipments from Moose Mountain to some southern and eastern points, its exports are insignificant. Compared with the size of the Dominion and its own growing needs, the reserves are not large and they are less favorably situated than the great ranges in our own lake region.

Newfoundland, however, is ideally situated for carrying on export trade and is endowed with reserves equal to the combined known resources of Africa and Asia and very nearly equal to those of all Europe outside of the Lorraine deposits and the even lower grade ores of Great Britain. The Wabana deposits on Bell Isle in Conception Bay and near St. Johns are estimated to contain some 3635 million tons of ore averaging 54 per cent of iron, or enough to supply the whole American consumption of pig iron for close to 500 years (at the present rate of 40 million tons annually). In addition to Bell Island, however, Newfoundland is credited also with still larger deposits of even richer ore in the western part of the island. The latter are mostly titaniferous magnetites, however, containing from 4 to 16 per cent of titanium oxide, and hence are

not commercially attractive under present conditions, although they contain up to 65 per cent iron.

The principal objection to Wabana ore is that the silica is high (often running up to 18 per cent) and, since phosphorus amounts to nearly one per cent, it would not find large use in either England or the United States. It averages well over 50 per cent of iron, however, and constitutes the main reliance of the steel works near Sydney, Cape Breton, which consume the bulk of the output. Recently Germany has been using Wabana ore, employing it, in some instances at least, instead of medium phosphorus ore that it used to get from Sweden. Mixed with local calcareous ores, the silica is not detrimental and the phosphorus is no disadvantage where the Thomas process is used and where even foundry irons run much higher in phosphorus than is usual in this country. The sulphur is almost as low as in the best Swedish ore, averaging about 0.02 per cent.

American Interests Active in South America

The iron resources of Chile are exploited by the Bethlehem Steel Corporation through a subsidiary which has extensive ore holdings. It has built its own ore docks on a good harbor and connected them with the mines by a 20-mile railroad. Development has progressed so that 1,000,000 tons could be produced annually, but the present output is only about half of this. The ore is rich in iron; one grade averages 65 per cent as shipped and is of Bessemer quality. In 1913 this ore cost about \$5.45 a ton delivered at Baltimore, including a charter freight rate of \$3 a ton in addition to the canal toll.

Whereas Chile has only about 100 million tons of reserves, Brazil is credited with almost 6000 million tons, averaging 60 per cent iron, much of which is Bessemer ore. Some idea of the magnitude of this figure may be gained by considering that these total reserves are equivalent to 3,500,000,000 tons of iron, or more than four times as much as the total output of pig iron in the United States during the last 120 years.

English furnacemen have been active in securing a foothold in Brazil and shipments to Great Britain are increasing steadily. While not much Brazilian iron ore has been used so far in the United States, American interests have secured several large holdings in Brazil. French, German and Brazilian capital has also tied up ore lands, but the only companies that have done much in the way of development are those financed in England. Among these the Itabira Co. deserves special mention because, in addition to its strictly mining work, it undertook the construction of the Victoria á Minas Railroad, which is the natural outlet for the most important ore region. The Central of Brazil Railroad also penetrates this area, connecting it with Rio de Janeiro, but the grades are steep and there are many sharp curves, rendering the shipment of ore by this route costly and difficult.

Doubtless Brazil is destined to become a great ore mining center in years to come but, for the present, rapid development is hindered by the remoteness of the deposits from the great iron and steel producing regions of the world. The mines are situated hundreds of miles from the coast, in a territory only partially opened up, and where fuel is too expensive to encourage local smelting.

Ore Imports Link Up with Prosperity of Eastern District

The use of imported ore is closely bound up with the future of iron making east of the Appalachians. It is not likely to penetrate into Pittsburgh or the Valley districts; its field is along the seaboard and the extent of its penetration inland depends upon the cost of delivering lake ore into these localities. Throughout this region there is the competition of Eastern ores—mostly magnetic—but these suffer (except for local consumption) from the handicap of having to be distributed north and south by rail whereas the imported supply may be tapped at Boston, New York, Philadelphia, Baltimore or Norfolk, with equal facility. Ocean freight on ore is normally about \$2 a ton, or a trifle more than the combined cost of moving ore from the

Northern ranges to lower lake ports. Since it is improbable that much ore can be mined from foreign deposits more cheaply than it can be won from Lake Superior mines, ore costs along the Atlantic Coast will doubtless remain higher there than in districts within easy reach of the Great Lakes.

The use of foreign ore, however, partly compensates for the presence of foreign competition which appears from time to time in the Eastern markets for iron and steel. Cheap pig iron in Europe means pressure on our coastwise markets, but under such circumstances European iron makers cannot pay such high prices for their raw materials and foreign ore will be cheap. Since its price, like that of other commodities, is dependent upon demand and supply, foreign ore will be expensive when the overseas trade in iron and steel is active and cheap when it is not.

With respect to domestic competition, it may be observed, the Eastern district suffers not only from higher ore costs but also because its fuel supply is ordinarily more expensive than at inland points. The handicap of higher priced raw materials is largely offset, however, by nearness to important consuming markets.

Mechanical Properties of Metals at Elevated Temperatures

The Bureau of Standards is constructing an apparatus for "long-time" tension tests to supplement equipment already available for studying the high temperature properties of metals. This new equipment will be used primarily to determine the limiting loads which can be used at different temperatures with the several types of materials already tested by ordinary methods of tension and compression. At the request of the joint committee on phosphorus and sulphur in steels, arrangements are under way to make short time tension tests at temperatures of from 20 to 1200 deg. C. on four of the steels used by the committee which contain varying proportions of sulphur. At the request of the special committee of the American Society for Testing Materials work has been started on the preparation of a report entitled "Available Data on the (Mechanical) Properties of Irons and Steels at Various Temperatures." This will form part of a topical discussion of the properties and applications of metals for high and low temperature service which will be held at the spring meeting of the American Society of Mechanical Engineers in Cleveland, under the auspices of that society and the American Society for Testing Materials.

Magnetic Test of Wire Rope

An investigation of the possibility of developing a non-destructive test for wire rope in hoisting service has been under way at the Bureau of Standards since July, 1923. At a meeting of the advisory committee for this investigation it was decided that methods involving magnetic testing should be given first consideration. It has been found necessary to obtain certain fundamental information not heretofore available before proceeding with the design of field apparatus. It was necessary first to consider the effect of stress on magnetic properties, since a hoisting rope in place is always under stress of varying magnitudes, according to the position of the load.

A method of analysis has been discovered which appears to be capable of indicating the relative proportions of the material which are under tension and under compression. This work has also demonstrated, apparently, that the difficulty heretofore experienced in attempting to find the laws of correlation between magnetic and other physical properties can be attributed to the effect of stress, as the magnetic properties are very sensitive to this influence.

Preliminary work has also been done on the effects on the magnetic properties of various factors causing deterioration of the steel wire from which the rope is made. A progress report covering this investigation has been prepared.

Survey of British Machine Tool Industry

Builders Concentrate on Either Light or Heavy Tools— Changes in Last Ten Years—Surplus of Automatics —Status of Other Tools Discussed

BY MAJOR JOHNSTONE-TAYLOR

AT the present time there are approximately 100 well-known companies in Great Britain engaged in the production of machine tools. While the majority of these are confined to the manufacture of tools and to some extent to the manufacture of one or two lines, specialization is not carried out to any great extent, lathe builders for instance building drilling machines and other light machine-shop equipment.

There is a tendency, however, for firms to concentrate either upon light machine-shop equipment such as constitutes the tools employed in the automobile industry or upon the heavier tools that find place in shops building locomotives, engines in general, pumping machinery and heavy electrical plant. In the former case manufacturers, except those engaged upon very special work, rarely build their own tools, whereas heavy machine shops are equipped quite extensively with tools of their own design and make. This has led to certain large engineering firms such as Vickers and Armstrong Whitworths taking up the manufacture of large tools as part of their everyday business.

The heavy machine-tool business, outside that of the firms just mentioned, is very much decentralized. To a great extent the work is in the hands of comparatively small companies which build a few large machines in a year either as repeat orders or to special designs. Firms of general engineers who for their own purposes, or for some outside company, have designed and built some more or less special form of tool, have placed similar tools on the market and built up in some cases an extensive business therein. Browns of Sheffield, for instance, a company engaged in the production of heavy gearing, principally in connection with turbine reduction gears, now produce plant for this class of work. Comparatively little foreign machinery of this class is on hand in Great Britain, such as does exist having been probably bought in the nature of an experiment.

Light Machine Tool Industry Has Changed

The light machine-tool industry is on an entirely different footing and has undergone a complete change during the last ten years. It must be remembered that mass production as it is understood in the United States was practically non-existent in this country before the war. Working to limit gages was confined to quite a small section of the automobile builders, while the use of automatic machinery was confined to such productions as small screws, electrical components, etc. The first firm to take up seriously the production of small parts to limit gage was the Birmingham Small Arms Co., which at that time was engaged exclusively in the manufacture of service rifles, automatic pistols and sporting guns, this introduction being instrumental in doing away with a practice common in Birmingham of skilled mechanics working in their own homes. This company designed and built most of its own machinery, and does so today. The advent of the bicycle, also taken up by this company, led to the importation from the United States of automatic machinery, which at that time was largely used in sewing machine manufacture. The first big step, however, toward intensive automatic production was made perhaps by Hans Renolds, Ltd., chain manufacturer, who has several hundred automatic machines, for the most part of Brown & Sharpe design.

In common with the introduction of textile machinery at an earlier date there was opposition on the part of skilled mechanics to this American machinery, but

the extension of the automobile industry led to its gradual adoption along with an extended use of the turret lathe. Although turret lathes of American manufacture have been installed in goodly numbers, their production as a high-class tool is now such a well established business of such concerns as Alfred Herbert, Ltd., Coventry, and Ward & Co., Birmingham, that their importation in the future is regarded as likely to be small.

Surplus of Automatic Machine Tools

As stated, the requirements of wartime production completely changed the whole aspect of engineering production. Mass production or no-mass production, millions of small parts had to be made and made to strict limit gage. Skilled mechanics were required in tool rooms, and this class of work had to be taken care of by female labor. The result was the importation of thousands of American machine tools. Automatics such as the Gridley, Cleveland and Brown & Sharpe came in by the ship load and British manufacturers soon realized their value. When the Disposals Board got to work after the Armistice, they bought up, often at bargain prices, an enormous number of machines, a big proportion of which had never been used.

At the same time mass production has not "caught on" in Great Britain. More than one company which laid out its shops for the mass production of automobiles has been forced out of business with the result that firms like Royces, producing a quality article, have practically reverted to pre-war methods. The result is that no attempt has been made on any scale to manufacture automatic machine tools in this country. There are many more in existence today than work can be found for, and with the present depression in the engineering industry such conditions seem likely to be in evidence for some time.

A fair number of grinding machines are built in Great Britain, being manufactured by only one or two companies, and the same remarks apply to milling machines, Herberts probably controlling the majority of the latter business. There is a fair proportion of American milling machines in the country, the Brown & Sharpe and Cincinnati designs seeming to be favored. Gear cutting machinery for automobile gears is almost exclusively of American manufacture, both the Fellows and Gleason types being well represented. In common with other machinery, over-importation during the war has prevented any serious development by British builders.

Presses Imported During the War

The press tool industry is largely supported by what is regarded as a "Birmingham Trade"—domestic hollow ware. Importations from America during the war, notably of E. W. Bliss Co. machines, was accounted for mainly by the abnormal demand thereof for the making of shell cases, this type of machine being virtually a monopoly of Taylor & Challen, Birmingham, which is probably the largest firm in Great Britain devoted exclusively to the manufacture of one class of tool. Hydraulic machinery for heavy work such as boiler making and ship-yard work is an old established business in Great Britain, being divided up among several comparatively small but long established companies. The manufacture of small automobile parts and similar articles in the form of pressings is not carried on in this country to any great extent, so that the demand for tools for this purpose can hardly be said to exist.

The engineering industry being widespread throughout the country, there cannot be said to be any definite location of any branch of the machine tool industry. The Birmingham area being the center of the automobile, cycle and gun industries, a large number of the light machine-tool makers are situated in that area. Heavy machine tools of all classes are made in the Manchester district while those connected with the ship and engine business are largely made in the shipbuilding areas of the Clyde and Tyne. Instrument making and such tools as it calls for are located principally in the London area.

As stated above, automatic machinery is little built here, reliance being made almost exclusively on American tools, which are generally considered excellent. The

excellence of such machinery no doubt accounts for the marked superiority of small mechanical articles of American origin. The American typewriter, the Waltham watch, the Eversharp pencil are standing tributes to the skill of the American mechanic in producing an excellent article at a low price made possible only by the perfection of automatic machinery.

There does not seem likely to be any serious attempt to make such machinery in Britain. In the first place the market is overstocked while in the second, certainly so far as the automobile industry is concerned, the preference of the buyer for individuality rather than for an article at the lowest possible price gives little or no encouragement for intensive mass production, for which the automatic machine is particularly suited.

French Shipbuilding Active

PARIS, FRANCE, Feb. 23.—French shipyards are making important demands for steel plates and hull and engine forgings. While there is considerable material available as left over in consequence of the cessation in warship building by reason of the Washington disarmament conference, this material is not sufficient to meet requirements. It is a factor, however, in lessening the time of deliveries as indicated in the bids, and added to the low rating of the franc has enabled French yards to secure important hull and engine orders from abroad.

Foreign orders for new ships have come from both Norway and Holland, and a few orders, for relatively small craft have been received from British sources. The St. Nazaire yards, the Dunkerque plant, the yards at Marseilles and those near Toulon are all busy. The work in hand is mainly for combined passenger and cargo carrying vessels, both deep-water craft and African coastal vessels. A Norwegian order for an 8000-ton motor vessel figures among the foreign orders received.

The French shipyards by reason of the low rating of the franc are experiencing a situation similar to that which the Germans encountered with the falling mark when there was a general rush from the outside to take advantage of cheap prices.

From the Penhoet works located at St. Nazaire, I learn that the designs for a new French passenger steamer for the New York-Havre service are in readiness, but that the order has not yet been put in hand. The new vessel, I understand, will bear a tonnage of approximately 40,000 and be driven by four turbine engines of a total of 48,000 hp. This power, it is believed, is sufficient to assure a maintained sea speed of 23 knots.

G. L. C.

Steel Co. of Canada Finances

President Robert Hobson of the Steel Co. of Canada gave out preliminary figures on March 6 which indicate that the company earned 12.4 per cent on its common stock after all charges and preferred dividends. The funded debt was reduced about three-quarters of a million dollars and working capital was increased by \$1,372,444. Mr. Hobson stated in an interview that after bond interest, sinking fund requirements, income tax, depreciation (to about the same amount as the preceding year), and all dividends, there remained a surplus for the year of \$627,875. There remained after preferred dividends, \$1,432,875 applicable to common stock, as compared with \$448,856 in 1922 and \$362,551 in 1921. The increase in working capital, Mr. Hobson pointed out, was largely due to increases in inventories and accounts receivable, inventories having grown by the policy of accumulating coal as insurance against the possibility of a coal strike in the United States and the accumulation of pig iron sufficient to meet requirements. Percentage of earnings on the turnover was less than in 1922, increased earnings in 1923 being due to increased turnover. With regard to 1924 business Mr. Hobson seemed optimistic, calling attention to the fact that the business of the company follows a cycle about two months behind conditions in the steel industry in the United States, which are now encouraging.

Directors declared the usual dividends of 1% per cent on common and preferred stocks for the quarter ending March 31. The annual meeting will be held at Hamilton, Ont., April 10.

Italian Steel Industry in 1923

The situation in the Italian iron and steel industries at the end of 1923 was characterized as one of continuance in the gradual, steady improvement that had gone on throughout the year, says Trade Commissioner A. A. Osborne, in a report to the Department of Commerce. The demand for iron and steel products had become more active in the latter months from the building trades, the electrical and hydroelectric companies and firms constructing aqueducts. The stagnation in new construction following the war lasted for a long time in Italy. Only during the past year or so has there been a real revival in new building and extensive alterations in existing structures.

Enhanced activity in the metallurgical and metal-using industries is shown by the growth of scrap iron imports from 39,300,000 lire in the 10 months ended Oct. 31 last, over the corresponding period of 1922, when imports totaled 68,478,888 lire. In the Italian metal industries scrap iron is of great importance since standard Italian foundry practice calls for a mixture of about half and half pig iron and scrap. A still larger proportion of scrap is used in Italy to make steel.

Aviation Base Planned in Brazil

The Federal Government of Brazil has let to a native firm of contractors a contract for the construction of a naval aviation base comprising four hangars for hydroplanes and embodying all the latest improvements in structures of this class, according to a report from Consul Herndon W. Goforth. It is estimated that the new aviation base will cost in the neighborhood of \$400,000 and that the contractors will be on the market for a considerable quantity of structural steel. The contracting company is known to be friendly to American exporters and during 1922 imported nearly \$1,000,000 worth of construction materials and equipment from this country.

Report on Chinese Iron Ore and Industry

The iron ores and iron industry of China have been presented in an exhaustive style by the Geological Survey of China in the shape of a paper-covered book of 180 pages of English, exclusive of the Chinese portion, and accompanied by a portfolio of 39 large maps. It is presented under the authorship of F. R. Tegengren and the report proper contains sketches, tables and a number of half-tone engravings of the ore and ore locations. Information regarding the publications may be obtained by applying to the Ministry of Agriculture and Commerce at Peking, China.

The American Malleable Castings Association has moved its offices from 1900 Euclid Avenue to 2013 Union Trust Building, Cleveland.

FRANC UPSETS BELGIAN PRICES

Market Quotations Unstable as Franc Falls—Little Business Being Done

ANTWERP, BELGIUM, Feb. 23.—The market for all products has become excessively excited and it is impossible to name a price at which business could be done. All kinds of prices have been quoted. Of course, this momentary situation is due to the new and sudden fall of the franc. The rates of exchange, especially this week, have fluctuated so much and with such big differences that quoting has become impossible.

With a rate for the dollar as 29.50 francs on Feb. 19, against 24.70 Belgian francs eight days earlier and finally today 26.80 Belgian francs for the same dollar, it will be easily seen how (if naming only one product) pig iron, which was still offered on Monday at 425 Belgian francs, went in the middle of the week up to 460

and later to 480 Belgian francs and even near 500. For the moment, however, no quotations are available.

To give another idea of the large difference in prices, certain works have booked orders for beams at 750 Belgian francs and 775 for bars, against respectively 600 and 650 Belgian francs a fortnight ago.

Lorraine and Luxemburg makers also abstain from quoting, so that we may conclude that nearly no business at all has been done. However, large demands and inquiries from America and England were available, but it seems that, notwithstanding the offered prices represented a large amount in francs, no large business was booked on account of the almost total absence of sellers.

The coal market also is stronger and prices, while not going to the same high level as iron and steel products, have raised considerably. The first reason for this was the strike of dockers in England. This upward tendency then was accentuated further by the higher rates of foreign moneys, i.e., the fall of the franc.

GERMAN IRON AND STEEL MARKET

Gradual Improvement in Industry—Fewer Unemployed—Slackness in Ruhr Coal Market

BERLIN, GERMANY, Feb. 21.—The German market is still depressed, but the industry seems to have passed the peak of the crisis. Though the astonishing rate at which prices were reduced during the last few weeks has generally slackened, some lines which had not lowered their price level sufficiently are still following suit. At the more reasonable prices demand has slightly improved and business is a little livelier, which is already reflected in a reduced number of unemployed. Generally customers move cautiously in expectation of further reductions.

Many firms are reverting to full time working hours and the number of unemployed is gradually decreasing. Though employment has improved, the total number of unemployed and on short time is estimated to be still about 4,000,000. During January the number receiving unemployment benefit, outside the occupied area, decreased from 1,551,000 to 1,429,000, the number of short-time workers from 643,000 to 401,000 and the number of dependents of full-time unemployed from 1,658,000 to 1,578,000. In the occupied area the number of unemployed and on short time is still more than 1,000,000. The statistics of the trade unions show a reduction from 22.1 to 20.5 per cent of their members out of work, and from 24.5 to 14.8 per cent on short time.

Foreign Competition

In the West German iron industry, price cutting has come to a standstill. Prices had reached the lowest possible level and they are showing a tendency to advance again. Some works which had offered bars for as low as 115 gold marks per ton (1.24c. per lb.) have withdrawn this quotation and increased it to 130 marks (1.40c. per lb.). The decline of the franc is enabling the French manufacturers to cut all prices, and the Saar and Luxemburg works have booked enough orders, mostly on foreign account, especially for the United Kingdom, to keep them busy for some time. They demand a longer time for delivery, as they are booked considerably ahead; for some rolled products and medium and thin plate they demand up to three months for delivery and have even declined orders for some specialties.

As German works can supply at an earlier date, they are securing more orders. The domestic demand is mostly filled by the German works, which are therefore better employed lately. They are taking on more men and most of them now employ more than 70 per cent of their former number. This has influenced quotations and the mills are keeping up the price level, which is at present about 130 to 140 marks per ton (1.40c. to 1.51c. per lb.) for bars. Some foreign contracts in rails have

also been taken against strong Belgium competition. The Iron Trade Association has decided on a further reduction in bars, universal iron and structural shapes, of 10 marks per ton; in hoop iron, 20 marks; thin plates, 10 to 50 marks, according to thickness; and rifled sheets 5 to 10 marks. Thick sheets are to remain unaltered.

Scrap and Ore.—A slight improvement is noticeable in the Rhenish-Westphalian scrap market, which may be attributed to the ending of the strikes and to the better employment of the iron and steel works, which show a greater demand, as their stocks have run low. Confiscations of stocks by the occupation authorities have also contributed to the scarcity. Though there is great uncertainty as to the future, prices are maintained and contracts are made at about 36 Dutch florins (\$13.46) for steel scrap and 23 florins (\$8.60) for chippings. Owing to the stiffness of the money market the turnover is small and traders are now giving two months credit. As soon as the iron works get in full working order it is expected that trade will liven up, especially as their stocks have run low.

Prices of Lahn-Dill iron ore have been reduced by 7 to 12 per cent, and it is reported that the French railroad authorities are introducing special rates for Lorraine minette ores to the Ruhr district, which would reduce the freight from 40 marks per metric ton (\$9.68 per gross ton) to 27 marks (\$6.53) in future. The Siegerland iron ore producers have again reduced prices by about 20 per cent to 24 marks (\$5.80) per ton for rost-spar, and 18.50 marks (\$4.48) for crude spar. Of the 35 blast furnaces in the district only six are at work.

It has been decided to establish a scrap exchange at Düsseldorf for the Rhenish Westphalian market. The contracts between the Scrap Buying Co., Berlin, and a large number of Upper Silesian and Central German iron and steel works, for which the former has been buying the scrap, have been renewed for 1924 and probably will be extended to 1925 as well.

Machinery and Hardware

Unemployment in the automobile industry has not assumed the same dimensions as in other industries but, owing to rumors of the impending abolition of import restrictions, many customers are postponing placing orders. Agricultural machine manufacturers also have reduced prices, but few orders are booked. The farmers complain of a scarcity of ready capital and, as the engineering works are not in position to give credits, the sale of machinery is hampered. On account of the keen competition, some associations in the industry had given up the fixing of scheduled prices for their members, a decision which has in some cases been forced by the competition of foreign makes. Export is only small, especially as the Eastern markets are giving few orders.

In the locomotive and railroad rolling stock industry, which has been poorly employed for some time, a slight improvement in employment is noticeable. This is

due mainly to orders for new rolling stock. Since the state subsidy to the railroads has ceased, they do their repairs in their own shops and give few orders to private firms.

An agreement has been concluded between the occupation authorities (Mission Interalliée) and the wire works in the occupied area, which will be in force until April 15. A tax of 2.5 per cent is to be paid on all wire, nails and wire rope. The tax payable under the agreement with the cutlery and hardware industry has been reduced to 36 per cent of the former rate and negotiations on other lines are pending.

Ruhr Activities

At the large works in the Ruhr district, Krupp, Thyssen, Gute Hoffnungshütte, Gelsenkirchen, Deutsch-Luxemburg, Bochumer Verein, Rheinstahl, Phoenix and Hoesch, only 33 of the blast furnaces are blowing. There have been many export inquiries lately but few have led to orders.

FRENCH IRON AND STEEL MARKET

Depreciation and Reparations Situation Cause Pessimism—Activity Is Increasing

PARIS, FRANCE, Feb. 22.—The French market has gathered a good deal of strength during the past week, with increased activity and prices sustained. Most of the plants have booked a fair volume of orders for export and at prices which, converted into francs, are higher than domestic. Price concessions therefore are out of the question at home.

French export of iron and steel was favorable last year, and we note an improving tendency in the line of transformation products and mechanical construction. This factor in other times would lead to a better confidence both at home and abroad, but we are unfortunately living through a disturbed period, where speculation is free. In January the amount of taxes paid in France was 2,300,000,000 fr., showing the efforts of the nation and the willingness to accept all necessary sacrifices. This does not, however, prevent currency decline and the continued ascension of the Anglo-Saxon exchange.

Depreciation and Reparations

If the depreciation of our money is partly set off by the relative extension of our foreign commerce, we have, on the other hand, a heavier burden to bear in all other lines, including a rise in the expenses of the plants, a higher cost of living and higher salaries, bringing increased costs at a time when we have to compete with our neighbors in foreign markets. This competition leads, of course, to price concessions—very detrimental to producers—and things will undoubtedly remain so until a necessary agreement is made.

In addition to these various factors there are other subjects of uneasiness in business circles: the hopes founded on the decisions of the Commission of Reparations experts have given way to a sentiment of pessimism after the last speech of the Reichs chancellor.

In Brussels the Bourse was exceedingly nervous on Wednesday [Feb. 20], due to the erratic movements of exchange; there were very few transactions recorded and prices were much on their previous level.

Coke.—During the first 16 days of February we have been supplied with 171,622 (metric) tons of coke, or a daily average of 10,726 tons, much of the tonnage received before the occupation. The amount of coke brought through Ehrang from Feb. 17 to 20 was 26,042 tons, making 197,664 tons altogether, without the arrivals through Aix-la-Chapelle, which are unknown. From these figures we may deduce that total deliveries for February will exceed 300,000 tons.

Pig Iron.—Up to the present time coke supplies are sufficient to allow for the increase of production. Prices are naturally subject to much variation now that the producers have to buy their supplies of coke either at home or abroad. The rise of exchange has thrown consumers into trouble and they are asking for urgent deliveries from the plants and middlemen to cover their

Coal.—The Ruhr coal market is still weak. Before the coal syndicate was reformed there was keen competition among the mine owners, but now firms not belonging to the syndicate are cutting prices, and some syndicate members are selling below the stipulated quotations. On account of constant rumors about an impending reduction in prices, traders and consumers have been holding back orders. An improvement is possible only if trade and industry in general revive. In the German Upper Silesian coal industry prices are gradually coming down and are now about 20 per cent above the 1914 level. Sales in large and medium grades of coal and sales of furnace and foundry coke have been brisk in the district lately.

January coal output of the Ruhr mines was 6,187,482 tons, of which 5,485,040 tons were produced by the mines in the occupied area. The daily production amounted to 237,980 tons, compared with 369,745 tons daily average during 1913.

needs in case of a further advance. The average is actually 380 to 385 fr. (\$16.64 to \$16.86 per gross ton at 23.20 fr. per \$1) for chill-cast foundry pig iron, No. 3, against 370 to 375 fr. (\$16.20 to \$16.42) the week before. Some of the plants well placed as to grade and orders ask 385 to 390 fr. (\$16.86 to \$17.08) per ton at mills. Four-months' contracts, however, have been placed at 370 to 375 fr.

Hematite is firm with an upward tendency and British grades are entirely out of the question because of price. The average is between 480 and 500 fr. per ton (\$21.02 to \$21.90) at mills, and 510 to 525 fr. (\$22.34 to \$23) delivered. The f.o.b. price for chill-cast is 425 fr. and 435 fr. for April (Belgian currency, equivalent to \$16.28 and \$16.66 at 3.77c. per fr.). Important orders are received from England, particularly as steamers are looking for return freight. The Lorraine and Luxembourg plants are selling basic, f.o.b. Antwerp, at the rate of 410 to 420 Belgian fr. (\$15.70 to \$16.08).

Ferroalloys.—All ferroalloys are very firm and those yielding manganese are quoted upward: for instance, the 76 to 80 per cent Mn is quoted at 1800 fr. (\$78.83). Spiegeleisen of 8 to 10 per cent is quoted at 630 fr. (\$27.60) per ton; 10 to 12 per cent, 650 fr. (\$28.47); 18 to 20 per cent, 800 fr. (\$35.04) delivered.

Semi-Finished Products.—Active market, new orders are placed with difficulty and plants have commitments for at least two months ahead. Prices are steady and range on the inland market between 46 and 48 fr. (\$20.15 and \$21.02) for ingots; 49 and 50 fr. (\$21.46 and \$21.90) for blooms; 51 and 52 fr. (\$22.34 and \$22.77) for billets, per 100 kg., in basic steel. Very few orders for export are had, with nominal prices. Germany buys actively.

Rolled Steel.—More active, but irregular in demand, with again many orders from Germany. There is a certain slackening in business with the Far East, principally Japan, as free trade for reconstruction materials has been suppressed since Jan. 31. We are, on the other hand, doing more extensive business with South America, notwithstanding the impediment caused to our shipments via Antwerp by the railroad crisis in Belgium. Prices tend to increase. Joists (beams) are quoted on the average of 54 to 57 fr. (1.06 to 1.11c. per lb.), with 10 to 12 weeks' delivery. In merchant bars large sizes are sold freely, while the placing of orders in small and medium sizes is rather difficult. The basis quotation is 56 to 58 fr. (1.09 to 1.13c. per lb.) in Lorraine; 57 to 59 fr. (1.11 to 1.15c. per lb.) in the east; 60 to 61 fr. (1.17 to 1.19c. per lb.) in the north. The Sarre plants, well booked ahead, are out of the market or quoting longer times and higher prices. F.o.b. quotations for export at £6 5s. (1.20c. per lb.) for beams and £6 15s. (1.29c. per lb.) for bars. The following orders have been adjudicated by the State Railroads: steel 42-kg. (93 lb.) traction springs at 143.15 fr. per 100 kg. (2.8c. per lb.) delivered at Le Mans; 14½-kg. (32 lb.) buffer springs at 156 fr. per 100 kg. (3.05c. per lb.) delivered at Sotteville; complete sets of coupling screws, weighing 363 kg. (800 lb.) each, have been sold at 165 fr. per 100 kg. (3.23c. per lb.).

Wire Products.—More active, with prices upward, due to important orders being booked for South America. At home orders that ought to have been placed in December and January are now coming on the market. F.O.B. Antwerp, wire rods are quoted £8 10s. to £8 15s. (\$36.55 to \$37.63). There is a rise of 5 fr. per 100 kg. on wire and nails and a higher increase on galvanized.

Sheets.—Medium and heavy sheets are the busiest lines of the group and big producers refuse orders. Heavy grades are upward at 67.50 fr. (1.32c. per lb.) in Lorraine; 70 to 72 fr. (1.37 to 1.41c. per lb.) in the

north, with 12 to 14 weeks' delivery. F.o.b. Antwerp, heavy grades are quoted £7 10s. to £7 12½s. (1.44 to 1.47c. per lb.). The light-gage section is improving, delivery 6 to 8 weeks. The production of sheets is increasing, some mills being put in operation again.

Foundry.—Business rather satisfactory. An order for 5000 tons of pig iron pipe lines for Buenos Aires has been shared by the Société de Pont-à-Mousson and the Conduites d'Eau de Liège. Cast steel buffers and fittings have been sold at 157.85 fr. per 100 kg. (3.09c. per lb.).

American Versus European Foundry Practice *

Fair Comparison Based on Relative Social and Economic Conditions—
Light Building Construction—Machine Tool Design

BY HENRY M. LANE

EUROPEAN and American conditions cannot be considered together without taking into account the causes which underlie their differences, nor can the practice in any given trade in two continents, whose social conditions differ so greatly, be considered without considering some of the causes which underlie the differences. In Europe the wage scale has never risen so high as it has in America, nor has the man-hour output risen to such a great extent, but the ratio between man-hour production and the wage scale is such that the ultimate production of many of the necessities is at a sufficiently low ratio to keep any foreign competition from coming in and monopolizing the market. This is particularly true in the case of articles of relatively small output and which to a greater or less extent have a local use.

The amount of iron used per capita per year in any community is to a certain extent an index of the general relationship of that people to their manufacturing problem. This, however, is modified by certain conditions in each country. For instance, in America, our wide-flung country with its long railroads, many bridges and heavy transportation problems, has necessitated the use of a great deal of iron and steel in connection with our transportation, and our hauls are long, so that the amount of metal required is great.

Relative Cost of Household Equipment

Our servant problem also has an important bearing on domestic and household equipment, and our use of the latter is much greater than any of the European countries. The French household is usually equipped with a fairly good line of cooking utensils, but they are made of the two good standbys, which are relatively indestructible. On the one hand, you have the heavy wrought copper cooking utensils, and on the other the cast iron utensils. Aluminum is coming into use to some extent over there, and is being used more every year. These two classes of kitchen ware last a generation or more, which reduces the manufacturing problem to a minimum. We use cheap stamped goods, many of which are enameled, with the average life scarcely three years.

In Europe the market is such that they cannot specialize and turn out great outputs of a product as we can, and this is why American sewing machines have to a large extent become the standard of the world. Also, in Europe we are facing the artistic side. The average workman over there is much more of an art artisan than he is a tradesman. In other words, in many of the plants the molder takes pride in his work, and he is an actual molder. This limits the number of pieces he turns out, but improves the quality, and where a com-

paratively few pieces are wanted this is not a serious item, though if mass production is required it becomes a prohibitive handicap. In this country if a man wants a small number of castings, as, for instance, for some special class of machine tools, they must be made under a very high wage scale, and the cost per pound rises proportionately. In Europe they are made by very much the same method, with about the same man-hour production, but the wage scale is much lower, so that the pieces are produced more cheaply. This has given the class of manufactures which cannot be worked into mass production an advantage.

These fundamental facts must be remembered in the first place. In the second place, European industries as a rule are on a smaller scale, and there are many small factories scattered all over the continent.

Appliances for Handling Material

The mental attitude of the manufacturers toward their problem is well illustrated in some of their practices with regard to handling appliances. The climate of much of Europe, particularly of France, Belgium and Italy, is not so severe as the climate of the United States, and their buildings do not have to be so solidly built to resist winds, nor do they have to be so heavily built to carry snow loads, nor so tightly built to keep out cold. Hence a light form of construction is used. Their steel trusses are made up of relatively small pieces, and generally of lattice construction. The roof trusses look to us more like cobwebs, and the roofs themselves are largely of tile laid on a system of wooden supports. In many cases the outer walls are of brick laid flat, one brick wide, which is about 4½ in. The bricks at the end of each panel are built into the steel work so that the building really consists of a series of brick panels built into the light steel work. The bricks are all laid in cement mortar. In some cases they go even further and place the bricks on edge, so that the brick wall itself is only about 2½ in. thick.

This very light construction makes a building which cannot be subjected to severe shocks or vibration, for, if it is, the tile will be cracked and broken, and the brick walls loosened where they are joined to the steel columns. As a consequence, crane runways supported on the building cannot be subjected to violent shocks, hence the cranes are run very slowly. This in turn limits their usefulness and their output, and frequently necessitates putting in extra cranes. This same system of adapting handling appliances to fit the relatively weak structures built only for protection is encountered in almost all branches of the work and has a marked effect on manufacturing methods.

There are noteworthy exceptions in which the cranes are supported on entirely separate structures, and in some cases these are of heavy masonry. In one foundry which I visited more than 20 per cent of the total floor

*Part of an address delivered at the Seventh Annual Convention of the Southern Metal Trades Association, New Orleans, Feb. 26-27. The author is president H. M. Lane Co., Detroit, Mich.

space of the area occupied was taken up by masonry pillars and supports for the walls and cranes. This was an extreme case of a plant built during the war when steel was not available, but in the older foundries I saw many in which 20 per cent of the area was taken up by walls and masonry work, and I saw extensions being constructed in the same manner.

The Building as a Machine

Thus far the Frenchman has not succeeded in comprehending the fact that not only in foundries, but in most American manufacturing plants we, to a greater or less extent, treat the entire plant with the building as a machine to produce its output, and we design the machine accordingly.

Line shafting in France is usually largely supported on a light network of lattice trusses. These would be prohibitive in this country on account of the large amount of fabrication expense involved, but with their relatively low wage cost they find it cheaper to spend the money in wages than to spend it for extra metal in the structure. They do not realize that in most cases the extra metal would serve to eliminate or reduce vibration and give a more rigid structure.

Their concrete structures, including crane runways, are very light indeed, and in many cases would not pass the building codes of any city in the United States, and in other cases would not pass the State factory inspection of many States in our country. The answer is that their cranes are all low duty and slow speed, and they do not introduce into the structure the strains that ours do. This, however, increases their handling expense.

It is easy to criticize another, but the criticism is unjust unless all of the factors are taken into consideration. When you consider the market rate of compensation for labor and the natural tendency of the local labor you promptly find that the practice, as it exists in many European shops, is for them good practice, for they are meeting a different set of fundamental conditions from those encountered in our country.

Machine Tool Design

The design of machine tools or foundry appliances in France, and in Europe generally, reflects the attitude of mind of the average workman, and much of their equipment is of relatively light construction and what we would call "trappy." They are used to adjusting machine parts, and used to many conditions which we are trying to eliminate. We try to make a machine foolproof, but they have not gone to that extent. Also many of their machines are not worked so fast as ours, and hence with them the heavy metal construction we have used is not a necessity.

In many parts of Europe fuel is expensive and anything that involves fuel consumption would be looked at many times before they decided to adopt the new method. This is one reason why many shops prefer hydraulic molding machines to compressed air machines, for the horse-power involved per unit of output between hydraulic and compressed air is from 10 to 15 times as great for compressed air compared with hydraulic work. When the output warrants it is easy to convince some of the larger concerns that the air unit will pay its way, but in other cases the natural conservatism will tend very strongly toward the use of hydraulic appliances. In this connection it may be said that Europeans are far more used to hydraulic appliances and their maintenance than we are in America, and this is particularly true of the foundry field. In the forging industry in this country we have accepted and used hydraulic machines in a great many cases, but they have not become popular in the foundry.

Unusual service performed by an automatic electrode regulator is reported in the case of the installation of a 2-ton Heroult furnace at the Millbury Steel Foundry Co., Millbury, Mass. The regulator, which was furnished by the General Electric Co., had been operating for six years without any attention whatever, the arcing tips on the contactors never having been repaired.

FOREIGN TRADE MEETING IN JUNE

Meeting of National Foreign Trade Council in Boston Will Discuss Need for Wider Markets

The general theme of the convention of the National Foreign Trade Council in Boston, June 4, 5 and 6, is announced as "Our Need for Wider Markets." This is the first time the convention has been held in New England and for the first time a session devoted to the interests of importers will be included in the program. This section of the convention will be held in cooperation with the National Council of American Importers and Traders.

Among the subjects to be discussed at the convention are: What should be included in a single general course on foreign trade; putting the foreign trade student to work; banking facilities for foreign trade; problems of the export manager; foreign trade, the key to prosperity; selling America abroad; transportation and foreign trade; direct selling; importing problems; foreign credits and credit information; advertising in foreign trade; merchant marine problems; the Government fleet and policy; American shipping; a practical solution of the stevedoring problem.

Committee reports include a report on world trade conditions, with special emphasis on the so-called "new" or non-European markets and a report on American foreign trade policy, covering a series of obstacles now encountered and suggestions for overcoming them.

Spring Meeting of Electro-Chemical Society

The spring meeting of the American Electrochemical Society in Philadelphia, April 24, 25 and 26 promises to be one of absorbing interest to electrochemists. The headquarters will be the Bellevue-Stratford Hotel. The technical meeting will be devoted to a symposium on "Organic Electrochemistry." Dr. C. J. Thatcher, chemical engineer and electrochemist, New York, will act as chairman. The other symposium covers "Recent Progress in Electrodeposition." S. Skowronski, research chemist Raritan Copper Co., is chairman. A series of papers has been planned for, covering "Electrorefining of Metals," "Electroreduction of Metals," "Electroforming of Metals" and "Electroplating of Metals." A large number of papers have been promised for this symposium and this probably will be the special feature of the meeting. There have been very many important changes taking place within the last ten years in electrolytic refining of metals and electrolytic winning of metals from leaching solutions. In this country, electrolytic zinc from leached solutions is being turned out at the rate of 200 tons a day. A plant in Canada is turning out commercially not only electrolytic zinc, but electrolytic copper and electrolytic lead. There has been completed the installation of a large Australasian electrolytic zinc plant at Risdon, Tasmania. Marked improvements have been made in the electrorefining of lead. Within the last few years the electrolytic refining of tin has gone through important stages. Large quantities of cadmium are now produced cheaply as a by-product of the electrorefining processes, particularly that for zinc, and cadmium has become an important metal for protecting steel from corrosion. Three plants in this country are devoting their entire energies to the electrodeposition of cadmium. Improvements in the electrolytic nickel process have also been made.

Another attraction of the technical program will be a round table discussion on "Electric Furnace Refractories." In addition to this discussion, there will be several interesting papers presented dealing with various phases of the subject.

Sales of mechanical stokers in February, according to statistics collected by the Department of Commerce, covered a total rating of 62,113 hp. This compares with 66,492 hp. for January and 60,870 hp., the monthly average for 1923.

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ESTABLISHED 1855

THE IRON AGE

EDITORS:

A. I. FINDLEY

WILLIAM W. MACON

GEORGE SMART

C. S. BAUR, General Advertising Manager

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Construction and Depression

WHILE not universally held, the theory has always had a large following, that protracted industrial depressions usually have as their chief cause indulgence in an excess of construction work. The argument is largely empiric. In a period of depression, it is seen that there is much less construction than in the preceding period of activity, which naturally suggests that there had been too much. Productive enterprises do not earn so much as they were expected to earn, suggesting that there is more than the public could be expected to support.

If the theory is correct the failure of the Mellon tax plan removes a possible danger, but a danger that could not have developed until some time in the future, for there would first have to be the period, perhaps of several years' duration, of heavy construction work in productive industries. If the Mellon plan is correct economically, there exists a shortage in such construction which would have to be made up before an excess could develop.

The theory that depressions are caused or intensified by excess of construction work, however, is not always considered as broadly as it should be. The important point has often been slurred over that the sudden decrease in construction work instantly produces a maladjustment which in itself is enough to produce depression by destroying confidence. If the entire country is at work, using five-sixths of its energy for supplying current needs and the other one-sixth for construction, meaning improvements or the investment of savings, and the latter activity suddenly stops, then this one-sixth is immediately without employment. In addition to men being out of employment, there is lack of employment for office buildings, hotels, transportation facilities, mining equipment and factories. That is enough to upset anything.

It may be well to consider, however, whether there is really as little construction work being done as would be suggested by the argument in favor of the Mellon plan of reduced surtaxes on personal incomes. The argument referred entirely to investment in productive enterprises. Those best fitted for planning and conducting such productive enterprises had invested their capital

in tax free bonds, issued by political subdivisions of the country. The issuing of such bonds has thus been encouraged, and States, counties and municipalities have been indulging freely in construction work.

There is also much construction work in the form of erecting dwelling houses. Statistics based on the dollars involved in such work show the item to be running very high. If the statistics were of square feet or cubic feet, the item of dwelling house construction would run much smaller. Unless people are to be content with less space per capita than before the war, it cannot be held that we are doing as much building as formerly.

The cost, however, is very high. We have it that the people who build dwelling houses must save for years in order to repay the cost, while at the same time they and others must pay high taxes to cover interest and principal of the bonds which have had such ready sale on account of being exempt from Federal tax.

We have here two factors, high taxes and the necessity of paying for dwelling houses, operating to reduce the spending power of the people as a whole in the ordinary everyday commodities and services, in food, clothing, railroad travel, etc. Perhaps the factors are not strong enough to cause a great change in our affairs. Time will tell. Encouragement of new enterprises, involving better and more economical methods, would help to relieve the situation by making goods and services cheaper.

Heavy Steel Production

THE American Iron and Steel Institute's report of steel ingot production in February discloses an even higher rate than was commonly estimated in the trade, even though it was everywhere recognized that there was a substantial increase over the January rate. From December to January there had been an increase of 17 per cent in the ingot rate, while it is now seen that from January to February there was an increase of 13 per cent. The February rate was only 4 per cent under the rate of April, 1923, which holds the record for all time.

Production reported for February was 3,604,862 tons, by companies which made 95.35 per cent

of the total output in 1922, and from this it is computed that total production was 3,780,663 tons, or a rate of 151,227 tons a day for the 25 working days. For a normal year of 311 working days, this means an annual rate of 47,000,000 tons.

The table below carries forward the comparison made in THE IRON AGE of Feb. 14 by two sets of relatives. The first relative takes the average rate of production in 1923 as 100, the second is based upon 54,000,000 tons as the actual practical capacity, as estimated in THE IRON AGE of Jan. 10, 1924.

Relative Steel Ingot Production		
1923	1923 = 100	Capacity = 100
January	102	82
February	103	83
March	108	86
April	113	91
May	112	90
June	104	83
July	101	81
August	98	79
September	96	76
October	95	76
November	86	69
December	82	66
Year	100	80
1924		
January	96	77
February	109	87

January of this year fell slightly behind January of last year, but February is well ahead of the preceding February. The peak production will be higher this year than last, or will be reached sooner. Just at the moment, with most steel buying markets rather quiet, there may be doubt whether last year's peak will be reached, but it will be recalled that the highest production rate of last year was not generally expected.

A rough approximation can be made as to production by the Steel Corporation and the independents respectively in February. The 54,000,000 tons total capacity may be divided 22,750,000 tons for the Steel Corporation and 31,250,000 tons for the independents, though with this division the Steel Corporation capacity is probably rated more conservatively than that of the independents. Assuming that the Steel Corporation's production was 95 per cent of its capacity, the production of independents would be 81½ per cent of their capacity, and the total production, as indicated in the table just given, would be 87 per cent of capacity.

There has been no physical disability of the mills for a year and a half, or since recovery from the coal strike of 1922. There has been no shortage of fuel or of transportation facilities and practically no shortage of labor. From late in 1916 until a year and a half ago there were physical disabilities except when the mills did not have a sufficiency of orders. Trouble when it comes seems natural and freedom from trouble also seems natural. We hardly realize how different the past year and a half has been from the six years that preceded.

IT has been frequently said that nine out of ten new projects fail, therefore that investment in a new enterprise is highly hazardous. This conclusion may be fair enough if the "new enterprises" include all stock-selling and investment propositions, honest or dishonest, sane or insane, wisely planned or not planned at all. But when the rule is put forward as true of manufac-

turing opportunities, it only serves to demonstrate the stupidity of a large proportion of men with capital, who will ask the advice of their bankers and brokers regarding the technical security of stocks and bonds, and consult their attorneys on the details of contracts and documents, but withhold or squander their surplus funds at the chance suggestion of a congenial but uninformed golf partner or club associate, instead of referring the controlling features of development, construction and sales costs and net profits to the trained judgment of manufacturers and engineers.

Cartography Run Wild

IN their effort to appeal to the mind through the optic nerve, so manifest in every publication dealing, even remotely, with business matters, some chart makers have allowed their enthusiasm for pretty pictures to run away with their judgments. It might be incorrect to apply to them the time-honored aphorism, "Figures won't lie, but liars will figure." Yet the public is entitled to protection from misleading charts no less than from misleading figures and statements.

This thought has long been with us. What brought it to the point of expression, however, is a recent glaring example of the misuse of the art of charting data, published by an insurance paper. Across the squared lines were traced the familiar peaks and valleys—mostly peaks—of the course of commodity prices since 1913, designated, in the next column, as "statistical gymnastics." On the same diagram was another line, horizontal from 1913 to 1917 and slightly drooping since then. This is the course of fire insurance rates. Note the word "rates." "It, alone and singly, has not indulged in the sport of mountain climbing," as the accompanying text has it.

It happens that each of the items entering into the different commodities, whose prices fluctuated so heavily, was affected not only by the law of supply and demand, but by the high cost of labor and the correspondingly high cost of materials used. This condition was not true of insurance rates. They were not affected by commodity prices because changes in commodity prices worked both ways—any increase in the amount of the insurance policy was reflected at once by a corresponding increase in the amount of the premium, leaving the rate stationary.

As a matter of fact, with an increasing proportion each year of buildings and goods protected by automatic sprinklers, there is every reason for expecting a gradually decreasing insurance rate per thousand dollars of property insured. It is hardly to be expected, however, that this rate, when worked out into figures of insurance premium per thousand square feet of floor area or thousand tons of machine tools or office furniture, will show a corresponding decrease when compared with 1913.

We see on every hand evidences of the fallacy of such a comparison as our contemporary has made. The average man carries a heavier line of insurance on his property today than he did ten years ago, because the reproduction cost is far higher. The rate is no heavier, but his premium

payments—for the self-same property—are. The same is true of his life insurance. Mortality rates are lower, hence the net premium per \$1,000 of insurance may be slightly lower, but total premiums per life are higher because a larger money value must be placed upon that life.

Charting of data is a science. It may often be done, and done accurately, by amateurs. But it cannot be done successfully by those who attempt to compare things which are totally unlike, as in the case cited. It cannot be done while the doer parks his reasoning faculties outside. It must be applied with judgment and the best is none too good.

Industrial Health Supervision

MOST of that which has been written concerning health supervision in industry has been by medical men in charge of the work. They reckon results in terms of reduction in the amount of disabling sickness among employees rather than in terms of dollars and cents. They have demonstrated that well-organized departments in large works and the attendance of a regularly employed outside physician in smaller establishments have brought about a very material saving in hours lost by absence from employment. With that as a basis, the conclusions of a large manufacturer as to the probable waste in industry through idleness consequent upon sickness are of particular interest, for waste can usually be eliminated, at least in part, and it has been said with a good deal of truth that dividends are paid out of the elimination of waste and the avoidance of loss.

Howell Cheney of Cheney Brothers, South Manchester, Conn., in relating the experience of his firm's great silk mills, sets forth that with conditions exceptionally favorable to healthful employment, owing to some years of careful health

supervision, the loss resulting from illness among the 4500 employees, constituting a cost which must be reckoned into production, is over a quarter of a million dollars. The loss to employees themselves through loss of wages alone is \$162,000; and the total loss to owners, workers and the community as a whole is \$570,000.

"If the losses to society be in that indefinite range between \$100 and \$150 a year for every person employed," says Mr. Cheney, "the expenditure (by the medical department) of \$20 or \$25 a person employed is not a speculation, nor is it a sentimental expenditure."

Mr. Cheney believes these great losses can be diminished very materially by means of health supervision. He knows that much has already been accomplished in South Manchester. The losses he speaks of are those in a great plant where a medical department has been operating for a considerable time on a comprehensive scale, with everything to do with, in the hands of highly trained men. The thought naturally arises, what would these losses be today in the same works had there never been any health supervision? According to Mr. Cheney's argument, by inference, they would be very much greater. This is coming to be the accepted belief in industry, certainly wherever health supervision has been established and given a fair try-out.

EXPORTS of tin plate have swollen to proportions never before reached in peace time. The peak came in January when, measured by the combined American and British exports, the total was 77,100 gross tons. The American proportion at 25,400 tons exceeded any month in over ten years, increased, of course, by the 13,300 tons sent to Japan. But even without this the remainder was of record size. The British at 51,700 tons was larger than the 1923 or 1913 monthly averages and was augmented by no unusual supply for any one country. In 1913 total exporting averaged 47,300 tons per month. Last year this reached 56,270 tons per month when both the American and British average exceeded prewar figures. This movement, which has lasted for over a year, is a factor in the firm tin plate prices here and in England and is named as one cause of the high prices for tin and the speculation dominating that market, based in part on a belief that there will be inadequate supplies within a year.

New York Steel Treaters

The regular March meeting of the New York Chapter of the American Society for Steel Treating will be held Wednesday evening, March 19, in the assembly room of the Merchants Association, Woolworth Bldg., and will be addressed by Dr. Ansel St. John, Union Carbide and Carbon Research Laboratories, Long Island City, N. Y., who will take as his subject, "X-rays in the Steel Industry." The February meeting was addressed by Prof. Bradley Stoughton, Lehigh University, who presented some of the recent developments in the heat treatment of cast iron. It was an elaboration of the article which was printed in *THE IRON AGE*, Jan. 3, entitled "Tying Gray or White Cast Iron in Knots." A number of metallurgists who were attending the annual February meeting of the mining engineers were present.

The Iron Age and Its Readers

THE IRON AGE hereby humbly apologizes to the postmaster at Brunswick, Me. It seems that some time ago *THE IRON AGE* published an item about a company at Brunswick which was planning to increase its production. Our correspondent jumped to the conclusion that the aforesaid company would need equipment in order to get out this greater production but apparently this was not true. A salesman for a machinery house investigated and writes as follows:

Mr. ——— informed us that there was absolutely nothing to it as far as new equipment was concerned. He said the item in *THE IRON AGE* had been an awful nuisance to him and the Brunswick post office. He showed me a waste basket which he had to empty four times daily on account of the mail in which he was not at all interested.

A movement is under foot to have the pay of postal employees increased. We have written to our congressman about it and he has promised to do what he can. Surely those postmasters who are overburdened deserve special consideration and possibly the clearly unrestrained activities of *IRON AGE* readers in their quest for business opportunities will serve to hasten the day of the rewarding of the postal people.

British and Continental prices per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at \$4.27 per £1, as follows:

Durham coke, delivered	£1 12½s.	\$6.94
Bilbao Rubio ore†.....	1 4	5.12
Cleveland No. 1 foundry	4 16	20.50
Cleveland No. 3 foundry	4 13	19.86
Cleveland No. 4 foundry	4 12	19.64
Cleveland No. 4 forge..	4 11	19.43
Cleveland basic.....	4 15	20.28
East Coast mixed.....	5 0	21.35
East Coast hematite....	4 19	to £5 0s.
Ferromanganese.....	17 0	21.13 to \$21.35
Rails, 60 lb. and up....	8 15	to 9 15
Billets.....	8 0	to 8 5
Sheet and tin plate bars,		34.16 to 35.23
Welsh.....	8 18¾	38.16
Tin plates, base box...	1 4½	to 1 5
		5.23 to 5.34
		C. per Lb.
Ship plates.....	9 10	to 10 0
Boiler plates.....	13 0	to 13 10
Tees.....	9 15	to 10 5
Channels.....	9 0	to 9 10
Beams.....	8 15	to 9 5
Round bars, ¾ to 3 in.	10 10	to 11 0
Galvanized sheets, 24 g.	18 5	to 18 7½
Black sheets, 24 gage..	13 10	to 13 15
Black sheets, Japanese		
specifications.....	15 5	2.91
Steel hoops.....	12 10	& 12 15*
Cold rolled steel strip,		2.39 & 2.43*
20 gage.....	17 2½	3.26

*Export price. †Ex-ship, Tees, nominal.

Continental Prices, All F. O. B. Channel Ports (Nominal)

Foundry pig iron:					
Belgium.....	£4 4s.	to £4 5s.	\$17.93 to \$18.15		
France.....	4 4	to 4 5	17.93 to 18.15		
Luxemburg.....	4 4	to 4 5	17.93 to 18.15		
Billets (nominal):					
Belgium.....	6 0	to 6 5	25.62 to 26.69		
France.....	6 0	to 6 5	25.62 to 26.69		
Merchant bars:					
Belgium.....	6 15				1.29
Luxemburg.....	6 15				1.29
France.....	6 15				1.29
Joists (beams):					
Belgium.....	6 10 and upward				1.24
Luxemburg.....	6 10 and upward				1.24
France.....	6 10 and upward				1.24
Angles:					
Belgium.....	8 0	to 8 5	1.53 to 1.57		
¾-in. plates:					
Belgium.....	7 15				1.48
Germany.....	7 15				1.48
¾-in. plates:					
Luxemburg.....	7 15				1.48
Belgium.....	7 15				1.48

British Iron and Steel Market

Pig Iron Weakening—Finished Steel Stagnant—
Continental Condition Improved—France
and Belgium Starting More Furnaces

(By Cable)

LONDON, ENGLAND, March 11.

Foundry pig iron has eased further, though there is slightly better domestic inquiry, owing to slackening Continental competition. Further furnaces are contemplating shutting down until there is a revival.

Hematite is easier and a further restriction of output is likely. Foreign ore is dull but steady. Sellers of Bilbao Rubio ask 24s. (\$5.12) c.i.f. Tees.

Finished iron and steel are stagnant, though New Zealand is inquiring for pipe plates and the Continent is inquiring for shipbuilding material. South Africa is taking further quantities of plates and sections, but the aggregate business is unsatisfactory and prices are tending downward.

Continental steel position basically is unchanged. Offerings here are less insistent, owing to heavy bookings. There is some revival in the German market on

numerous orders secured at low prices. Ruhr makers are negotiating for a resumption of Lorraine minette ore deliveries against coke.

In France 134 furnaces were blowing Feb. 1, against 125 on Jan. 1. In Luxemburg Arbed (Acieries Reunies de Burbach-Eich-Dudelange) has lighted its sixth furnace at Dudelange [all there are there are now in use], introducing the 9-hr. day. Hadir (Société des Hauts-Fourneaux et Acieries de Differdange) is blowing in a second unit [of the three] at Ottange, Lorraine.

In Belgium the market is steadier. The Société Anonyme John Cockerill, Seraing, blew in the sixth furnace [out of six] on March 1, and is planning to relight the seventh Ougrée furnace next month. The total number of furnaces now blowing in Belgium is 45.

Tin plate business is still rather quiet but prices are well held. Few sellers will take below 24s. 9d. (\$5.29) and the 25s. (\$5.34) basis IC, f.o.b., is more generally quoted. The official minimum price of 23s. 6d. (\$5.02) is still unchanged. Export demand is subdued; the Far East and India are stagnant; Spain and Holland have bought moderately.

Galvanized sheet market is patchy. There have been moderate sales to overseas markets but India is dull.

Large Tax Refunds to Steel Companies

WASHINGTON, March 11—The Treasury Department recently sent to Congress a list of corporations and other taxpayers which had been allowed refunds on tax payments for the fiscal year ended June 30, 1923.

Among the list were the following, together with the amount of refunds:

Alan Wood Iron & Steel Co., Philadelphia, \$480,051.61; McKinney Steel Co., Cleveland, \$952,045.16; General Electric Co., Schenectady, N. Y., \$887,587.16; General Electric Co., Washington, \$255,597.11; American Tool Works, care of Baker & Baker, Washington, \$138,545; American Vanadium Co., Pittsburgh, \$455,217.92; Latrobe Electric Steel Co., Latrobe, Pa., \$249,248.19; General Refractories Co., Chester, Pa., \$276,733.86; Columbia Steel & Shafting Co., Pittsburgh, \$121,811; Erie Forge Co., Erie, Pa., \$344,137; American Steel Foundries, Chicago, \$234,955; Camden Forge Co., Camden, N. J., \$432,307.52; Andrews Steel Co., Newport, Ky., \$656,954; Pollak Steel Co., Cincinnati, \$125,086; New Jersey Zinc Co., New York, \$1,148,296; Matthiessen & Hegler Zinc Co., LaSalle, Ill., \$133,072;

Solvay Process Co., Syracuse, N. Y., \$183,689; American Brass Co., Waterbury, Conn., \$766,275; K. G. Roebbling, executor of the estate of Ferdinand W. Roebbling, \$151,346; Singer Mfg. Co., Elizabeth, N. J., \$1,623,473.92; Singer Mfg. Co. and affiliated company, \$350,000.

Thomas Stack in Hellertown, Pa., Sold and Will Be Dismantled

Henry Potts & Co., 1610 Bankers Trust Building, Philadelphia, formerly in the Real Estate Trust Building, have purchased from the Thomas Iron Co. its blast furnace at Hellertown, Pa., and will begin at once the dismantling of the stack.

Henry Potts & Co. are also dismantling a blast furnace at Sharpville, Pa.

The March meeting of the Cincinnati Chapter, American Society for Steel Treating, to be held March 13, will be addressed by W. J. Harris, metallurgist of the Studebaker Corporation, the subject being "Factors Governing the Machineability of Steels."

MITSUI BUILDING CONTRACT LET

Americans to Build Bank in Tokio—Japanese Railroads in Market—American Importers Still Active

NEW YORK, March 11.—Trade with Japan continues to be largely confined to purchases by municipalities and from semi-governmental sources. A fair degree of activity continues from Chinese merchants. Importation of Continental bars and structural steel into the United States continues, but with slight weakness in the American pig-iron market, which lends an air of uncertainty to the future, there is but little activity in Belgian and French pig iron at present, although the Continental pig-iron market is reported to have receded slightly from its recent level.

The first noteworthy contract for construction of new buildings in the earthquake area in Japan has been let by Mitsui & Co. to James Stewart & Co., New York. The architects are Trowbridge & Livingstone, New York. The new building, of structural steel, reinforced concrete and granite, will be erected on the site of the old Mitsui Bank, which was destroyed by fire at the time of the earthquake. The new building will be occupied by the Mitsui Bank and the Mitsui Trust Co., exclusively. It will be one of the largest buildings in the Far East, 160 x 320 ft., and 100 ft. high, fronting on three streets. Across the front will be 16 engaged Corinthian columns, 76 ft. high. With the exception of the granite, which will be furnished from Japanese quarries, the structural steel and other material will probably be purchased in the United States.

Among pending inquiries from Japan is the tender of the Imperial Government Railways for 500 tons of sheet piling. Kobe municipality has not yet closed on the frogs and switches recently inquired for and the Kee Kin Electric Railway is in the market for 6½ miles of 100-lb. rails. Some interest in structural material is noted. One Japanese export house recently booked about 70 tons of structural steel.

Importers of Continental material into the United States are still able to quote low prices on structural steel from Belgium and France, and one importer with German mill connections is able to quote exceedingly favorable prices, c.i.f. Atlantic port, on German bars. In addition to sales to consumers of structural steel, importers report orders for slightly smaller tonnages from warehouses in Philadelphia and other Atlantic ports. The uncertain condition of the domestic pig iron market is at present a deterrent to further importation of pig iron from Europe.

Standard Welding Plant Sold

The Standard Welding Plant of the Standard Parts Co., Cleveland, consisting of eight acres of land and buildings having between 400,000 and 500,000 sq. ft. of floor space, has been sold to Andrew Squire, an attorney representing unnamed interests, subject to confirmation of court on March 15. The creditors of the Standard Parts Co. have so far received 68½ per cent of their claims and with the sale of this plant the amount paid to creditors will be approximately 75 per cent.

Replogle Steel Co. Considers Building By-Product Coke Plant

In the annual report of the Replogle Steel Co. by J. L. Replogle, chairman, and Leonard Peckitt, president, it is stated that although the result of the business during the year is disappointing, it is confidently believed that the purchase of the stock of the Empire Steel & Iron Co. will ultimately prove the wisdom of bringing together the two properties. It is announced that the management has given much thought and attention to the question of a permanent coke supply and plans are now being considered for the erection of a

by-product coke plant at or near Wharton. The report adds:

"With large bodies of iron ore that can be cheaply mined, and a modern up-to-date smelting plant located within 40 miles of New York City, the final erection of finishing mills, so that hot metal from your furnaces can be turned directly into steel or other finished products, seems most desirable."

Steel Corporation's Orders Increase

Unfilled business on the books of the United States Steel Corporation as of Feb. 29 aggregated 4,912,901 tons or 114,472 tons more than remained unfilled at the close of January. In January the unfilled business increased 353,090 tons and in December 76,755 tons. Previous to December, last year, however, there was a period of eight months when a falling off in the unfilled tonnage was reported each month. A year ago the unfilled tonnage was 7,283,989 tons or 2,371,088 tons more than on the books Feb. 29.

Following is the unfilled tonnage as reported by months by the Corporation beginning with January, 1922:

	1924	1923	1922
January	4,798,429	6,910,776	4,241,678
February	4,912,901	7,283,989	4,141,069
March		7,403,332	4,494,148
April		7,288,509	5,096,917
May		6,981,351	5,252,228
June		6,386,261	5,635,531
July		5,910,763	5,776,161
August		5,414,663	5,950,105
September		5,035,750	6,691,607
October		4,672,825	6,902,287
November		4,368,584	6,840,242
December		4,445,339	6,745,703

President Crawford Announces Plans for Fairfield Plant

BIRMINGHAM, March 11.—President George Gordon Crawford of the Tennessee Coal, Iron & Railroad Co., today announced that plans were being worked on for an open-hearth plant of four furnaces, and a sheet mill to produce plain and corrugated black galvanized sheets, to be located at Fairfield works. No estimate is given as to cost nor was any statement made as to when the work will be started. This announcement was anticipated in the issue of THE IRON AGE of March 6.

Chairman Schwab Confers with President Coolidge

WASHINGTON, March 11.—Chairman Charles M. Schwab of the Bethlehem Steel Corporation was in conference here yesterday with President Coolidge and said he told the President that the failure of Congress to pass the Mellon tax bill and the hysteria over the oil leases are retarding business. Mr. Schwab also recited conditions in Europe as he saw them during his recent visit abroad. He was the President's guest at luncheon at the White House following the conference.

Scrap Dealers to Hold Annual Meeting

The eleventh annual meeting and dinner of the National Association of Waste Material Dealers will be held March 9, at the Hotel Astor, New York. At the meeting, the president for the coming year and 18 directors will be elected. In the past year, 128 companies have been admitted to membership in the organization and a Southern division has been formed. For president in the coming year, Harry S. De Groat of Philadelphia has been renominated. The board of directors of the association has been increased from 25 to 31 members, including the president.

Among the speakers at the dinner will be Senator James E. Watson of Indiana and Capt. Irving O'Hay, humorist. The banquet committee under the chairmanship of H. H. Cummings includes Henry Lissberger, E. A. Stone and John A. Murphy.

NEW HEAT TREATMENT TERMS

Proposed Tentative Definitions of Steel Treaters— "Loneal," Coined Term

For some time a sub-committee on heat treatment definitions of the American Society for Steel Treating has been intensively discussing the compilation of suitable definitions for the various processes in the heat treatment of steel, recognizing that there is too much confusion among the various terms used. A tentative report has been approved by this committee and consists of R. M. Bird, chairman; Prof. Bradley Stoughton, Lehigh University, Bethlehem, Pa.; H. J. French, physicist Bureau of Standards, Washington; Sam Tour, metallurgist Doehler Die Casting Co., Brooklyn, N. Y., and B. F. Shepherd, assistant metallurgist Ingersoll-Rand Co., Phillipsburg, N. J. This report was first presented to the recommended practice committee of the society which approved it for submission to other technical societies and interested individuals as well as to the membership of the society itself for their comments. This connection precedes the adoption of the recommendations as tentative recommended practice by the Society.

The new definitions include the coining of a new word "Loneal." The reason for this is more fully explained in the abstract of the report which follows:

Foreword

1. During recent years, heat treatments have become more and more complicated and as a result there has arisen certain confusion in regard to the meaning of commonly used terms. For instance, in one locality or trade, any operation of heating and cooling resulting in a softening of the material is being called annealing, whereas in other places to "anneal" means not primarily "to soften" but to heat to above the "critical temperature" and to cool very slowly. Similar confusion as to the meaning and application exists in regard to other terms and as a result "annealing," "tempering," "normalizing," etc., are being used by different people to mean widely different things.

2. In any attempt to accurately define the terms commonly used in connection with heat treatment, the first question to decide and the most important one is: Do the terms relate to the heat treatment operation itself or to the results obtained by the treatment? In other words, is the term indicative of the structure or the condition obtained or of the operation performed?

3. After careful consideration, it appears most logical and most in keeping with present day usage to have the terms so defined that they shall mean definite operations and shall not be considered as referring to the structures or general conditions resulting, although, in a great majority of cases, the structures or conditions resulting may be quite similar.

4. At first glance, it would appear entirely unnecessary to coin any new words. It seems, however, that one of the reasons for the confusion that has come to exist is the lack

of adequate terms with which to express the different operations and conditions met with. In suggesting the use of the term "loneal," an attempt is made to relieve the term "anneal" of some of the misuse which it suffers and to eliminate the term "draw" which has such wide application in regard to the mechanical operations performed on metals as distinct from thermal treatments.

5. In commercial practice, the terms here defined will vary slightly depending upon the material under consideration. A "relatively slow rate of cooling" does not mean the same thing for an alloy steel as for a plain carbon steel, but the general meaning of the terms should remain the same regardless of material being treated. This must necessarily be the case if the term relates to the actual operation and not to the structure or the condition resulting from the operation.

6. Heatings and coolings, during any part of which steel is worked mechanically, are excluded from the meanings of the terms here given.

7. By "heating" as appearing below, is meant a thorough and uniform penetration of the heat.

8. By "critical temperature" as appearing below, is meant that temperature which is customarily associated with the following phenomena:

- (a) Hardening when quenched.
- (b) Loss of magnetism.
- (c) Absorption of heat.
- (d) Formation of solid solution.
- (e) Pronounced refinement of coarse grain upon cooling.

HEAT TREATMENT DEFINITIONS

1. *Annealing*: Heating above the "critical temperature" followed by a relatively slow rate of cooling.

2. *Loneal*: Heating below the "critical temperature" followed by any rate of cooling.

3. *Normalizing*: Heating above the "critical temperature" followed by an intermediate rate of cooling. (Note)—In good practice, the heating is considerably above the "critical temperature."

4. *Spheroidizing*: A long time heating at or about the "critical temperature" followed by slow cooling throughout the upper part of the cooling range. (Note)—For the purpose of spheroidizing the cementite in high carbon steels.

5. *Hardening*: Heating above the "critical temperature" followed by a relatively rapid rate of cooling.

6. *Tempering*: Reheating, after hardening, to some temperature below the "critical temperature," followed by any rate of cooling.

7. *Carburizing*: Adding carbon, with or without other hardening elements, such as nitrogen, to wrought iron or steel by heating the metal below its melting point in contact with carbonaceous material.

8. *Case Hardening*: Carburizing the surface portion of an object and subsequently hardening by suitable heat treatment.

9. *Cyaniding*: A specific application of carburizing where the object, or a portion of it, is heated and brought into contact with cyanide salt.

Comments on these definitions will be gladly received and should be addressed to J. Edward Donnellan, secretary to the recommended practice committee, 4600 Prospect Avenue, Cleveland.

FEBRUARY STEEL OUTPUT

Daily Production Rate 13½ Per Cent Larger Than in January—Yearly Rate 47,000,000 Tons

Steel ingot output in the United States in February increased considerably over that in January, but it was less than the January expansion over December. The daily rate last month was the third largest in the last 14 months or about 6500 gross tons per day less than the record peak, April, 1923. The increase last month was 180,725 tons over January as compared with 756,170 tons in January over December. In daily rate the increase was 17,890 tons per day, comparing with 19,580 tons per day in January over December.

The statistics of the American Iron and Steel Institute indicate a daily rate last month of 151,227 tons, as compared with a daily average of 133,331 tons in January. The February output of companies which made 95.35 per cent of the country's total was 3,604,862 tons which, assuming that the 4.65 per cent not reporting produced the same percentage of the total as in 1922, points to a total February output of 3,780,663 tons. This is an annual rate of about 47,000,000 tons.

The table below gives the production by months of the different kinds of steel, together with estimated daily rate for all companies.

Monthly Production of Steel Ingots, Reported by Companies Which Made 95.35 Per Cent of the Steel Ingots Production in 1922

Months	Open-hearth	All Bessemer	Other	Calculated	Approximate
				Monthly Production All Companies	Daily Production All Companies, Gross Tons
1924					
Jan. ...	2,752,932	667,032	12,577	3,599,938	133,331
Feb. ...	2,894,872	695,905	14,085	3,780,663	151,227
1923					
Jan. ...	2,906,892	728,270	9,467	3,622,369	141,569
Feb. ...	2,613,564	669,903	10,797	3,454,918	143,955
March ..	3,046,309	799,525	12,841	4,046,854	149,883
April ...	2,974,579	772,485	13,933	3,944,412	157,776
May ...	3,136,558	847,418	16,719	4,195,800	155,400
June ...	2,821,239	737,845	15,483	3,748,890	144,188
July ...	2,658,449	680,884	11,496	3,514,241	140,570
Aug. ...	2,796,370	701,059	9,326	3,677,771	136,214
Sept. ...	2,539,653*	613,709	8,602	3,316,166*	132,647*
Oct. ...	2,724,371	649,452	9,163	3,547,966	131,406
Nov. ...	2,343,368	616,335	9,309	3,113,804	119,762
Dec. ...	2,130,613	570,004	10,912	2,843,764	113,751
Total ..	32,691,965	8,386,859	128,048	43,226,955	138,993

*Revised.

Iron and Steel Markets

OUTPUT AT RECORD RATE

Over 91 Per Cent Capacity Operations,
with Few Weeks' Orders

Hesitation in Forward Buying and Chiefly in
the East—Lower Sheet Prices Established

In the face of orders for only four to six weeks in most forms of steel, the industry is operating at an annual rate of over 49 million tons of ingots. This is equivalent to 91 to 92 per cent of capacity and compares with the actual production in 1917 of 43,620,000 tons. Consumption is correspondingly heavy, but manufacture for stocks is also going on, in tin plate, in wire and in general in lines in which stocking is possible. The excess of output over live demand is not large and is prompted in part to provide against any early loss of labor to the outdoor occupations and in part to help scheduling of rolling operations.

The February steel ingot statistics of the American Iron and Steel Institute show that the rate of operations throughout the month averaged more than 87 per cent of capacity, a 47,000,000 tons per annum rate being indicated. February in fact proved to be only 4 per cent under April, 1923, when the daily output was the record for all time. The rebound shows one-third increase in the two months since December.

Feeling that the expansion has been greater than can easily be maintained, buyers have not given up hope of covering at concessions. On business for immediate delivery they have succeeded, but firmness obtains in forward commitments.

At the moment steel makers working at high pressure to satisfy a liquid consumptive demand of unusually large proportions find a sharp, perhaps accidental, slump in continuing demand. How much this is due to the political unsettlement or may lean on the price question for solution is not clear.

It is in Pittsburgh and the East that hesitation is especially apparent. In the Chicago district structural steel activity, for example, now is accentuated. Of the freight cars bought in the past week 40 per cent will be built by Chicago plants, leaving it for the mills there to supply the 60,000 tons of bars, plates and shapes needed.

The basis for sheet business at Pittsburgh is now so frequently 2.90c. for blue annealed, 3.75c. for the black and 4.90c. for the galvanized, that the Steel Corporation's prices \$2 a ton higher are giving the market two sets of prices. Following heavy bookings of December, consumers are evidently not in such need that they can be induced to pay the advances over current billings for the second quarter.

Chicago mills in contrast are being pressed with specifications against second quarter contracts and demand has expanded for blue annealed sheets for the smaller type of tanks for the oil fields.

In the East steel bars in large lots have been bought at 2.35c., Pittsburgh, and plates are moving at 2.30c. in carload lots.

Disappointment is country-wide in wire demand. Ordinarily specifications at this season are greatly in excess of production, shipments being drawn from accumulated stocks.

A hotel project in Chicago calls for 17,000 tons of structural steel and a hotel addition in the same city 5000 tons. Other structural steel inquiries make the week's total close to 44,000 tons, while awards were nearly 22,000 tons.

The new extras on cold finished steel bars and shafting, coming eight months after the hot rolled bar card, which was slow in being adopted broadly, represent an advance of \$2 a ton. Business now on the books is not affected.

The Clover Leaf has bought 8000 tons of standard rails, another road may increase its purchases by 25,000 tons and the Rock Island's program this year includes replacing with heavy rail 296 miles of track, most of it not yet ordered.

Freight car buying has been at the rate of 5000 cars a week, as compared with an average of less than 2000 per week last year.

The pig iron market is unsettled and in the East one or two important buyers have been able to obtain large concessions, although on ordinary business prices are pretty well maintained. In eastern Pennsylvania production exceeds demand and stocks recently have increased. In the South good prices are obtained for nearby delivery.

Increasing activity in France and Belgium is simultaneous with a slowing down in Great Britain, where iron and steel are stagnant and prices are tending downward.

THE IRON AGE pig iron composite price has dropped 2c. to \$22.86 since last week, being now more than \$7 below the price of one year ago and about \$4.50 above the price of two years ago.

Finished steel is lower, THE IRON AGE composite price being now 2.746c. per lb., against 2.760c. last week. This is the lowest it has touched since the 2.710c. of just one year ago. Its maximum during that interval was 2.824c., at the end of April.

Pittsburgh

Steel Works Operations Still Heavy as Market
Becomes Less Active

PITTSBURGH, March 11.—While the steel market has grown distinctly quieter in the past week, there has been no response to that development in steel works operations which, if anything, are a little heavier than they were last week. The Carnegie Steel Co. this week is operating about 95 per cent of ingot capacity and the leading local independent, which last week was running between 85 and 90 per cent of capacity, now is between 90 and 95 per cent.

There has been no material decrease in ingot production in the Youngstown district from the recent

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics
At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Mar. 11, 1924	Mar. 4, 1924	Feb. 12, 1924	Mar. 13, 1923
No. 2X, Philadelphiaf.....	\$24.13	\$24.26	\$24.13	\$31.76
No. 2, Valley furnacef.....	23.00	23.00	23.00	30.00
No. 2, Southern, Cin'tif.....	26.55	26.55	26.55	31.05
No. 2, Birmingham, Ala.f.....	22.50	22.50	22.50	27.00
No. 2 foundry, Chicago*.....	24.50	24.50	24.50	31.00
Basic, del'd, eastern Pa.....	21.50	22.75	22.75	29.50
Basic, Valley furnace.....	22.00	22.00	22.00	30.00
Valley Bessemer, del. P'gh.....	25.26	25.26	25.26	31.77
Malleable, Chicago*.....	24.50	24.50	24.50	31.00
Malleable, Valley.....	22.50	22.50	23.00	30.00
Gray forge, Pittsburgh.....	23.76	23.76	23.76	31.27
L. S. charcoal, Chicago.....	29.15	29.15	29.15	34.65
Ferromanganese, furnace.....	107.50	107.50	107.50	120.00

Rails, Billets, Etc., Per Gross Ton:	Mar. 11, 1924	Mar. 4, 1924	Feb. 12, 1924	Mar. 13, 1923
O.-h. rails, heavy, at mill.....	\$43.00	\$43.00	\$43.00	\$43.00
Bess. billets, Pittsburgh.....	40.00	40.00	40.00	45.00
O.-h. billets, Pittsburgh.....	40.00	40.00	40.00	45.00
O.-h. sheet bars, P'gh.....	42.50	42.50	42.50	45.00
Forging billets, base, P'gh.....	45.00	45.00	45.00	52.00
O.-h. billets, Phila.....	45.17	45.17	45.17	48.67
Wire rods, Pittsburgh.....	51.00	51.00	51.00	50.00
Skelp, gr. steel, P'gh. lb.....	2.30	2.30	2.30	2.35
Light rails at mill.....	2.00	2.00	2.00	2.15

Finished Iron and Steel,

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia.....	2.57	2.57	2.57	2.725
Iron bars, Chicago.....	2.40	2.40	2.40	2.50
Steel bars, Pittsburgh.....	2.40	2.40	2.40	2.35
Steel bars, Chicago.....	2.50	2.50	2.50	2.35
Steel bars, New York.....	2.74	2.74	2.74	2.69
Tank plates, Pittsburgh.....	2.40	2.40	2.50	2.35
Tank plates, Chicago.....	2.60	2.60	2.60	2.50
Tank plates, New York.....	2.64	2.64	2.69	2.69
Beams, Pittsburgh.....	2.40	2.40	2.50	2.35
Beams, Chicago.....	2.60	2.60	2.60	2.45
Beams, New York.....	2.69	2.69	2.74	2.69
Steel hoops, Pittsburgh.....	3.00	3.00	3.00	3.05

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

The prices in the above table are for domestic delivery and do not necessarily apply to export business.

Sheets, Nails and Wire,	Mar. 11, 1924	Mar. 4, 1924	Feb. 12, 1924	Mar. 13, 1923
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh.....	3.75	3.85	3.85	3.75
Sheets, galv., No. 28, P'gh.....	4.90	5.00	5.00	4.85
Sheets, blue an'd, 9 & 10.....	2.90	3.00	3.00	2.90
Wire nails, Pittsburgh.....	3.00	3.00	3.00	2.80
Plain wire, Pittsburgh.....	2.75	2.75	2.75	2.65
Barbed wire, galv., P'gh.....	3.80	3.80	3.80	3.45
Tin plate, 100-lb. box, P'gh.....	\$5.50	\$5.50	\$5.50	\$4.95

Old Material, Old Material, Per Gross Ton:

Carwheels, Chicago.....	\$20.50	\$20.50	\$21.00	\$28.50
Carwheels, Philadelphia.....	19.00	19.00	21.00	26.00
Heavy steel scrap, P'gh.....	20.00	20.00	22.00	24.00
Heavy steel scrap, Phila.....	17.00	17.00	19.00	25.00
Heavy steel scrap, Ch'go.....	17.00	17.50	18.00	24.00
No. 1 cast, Pittsburgh.....	20.50	20.50	21.50	26.00
No. 1 cast, Philadelphia.....	18.50	19.00	21.00	28.00
No. 1 cast, Ch'go (net ton).....	20.50	20.50	21.00	26.00
No. 1 RR. wrot. Phila.....	19.00	19.00	22.00	27.00
No. 1 RR. wrot. Ch'go (net).....	14.50	14.50	15.50	21.00

Coke, Connellsville, Per Net Ton at Oven:

Furnace coke, prompt.....	\$4.15	\$4.15	\$4.00	\$7.50
Foundry coke, prompt.....	5.00	5.00	4.75	4.25

Metals,

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York.....	14.25	14.00	12.75	17.12½
Electrolytic copper, refinery.....	13.75	13.75	12.50	16.75
Zinc, St. Louis.....	6.55	6.75	6.72½	7.80
Zinc, New York.....	6.90	7.10	7.07½	8.15
Lead, St. Louis.....	9.50	9.50	8.85	8.25
Lead, New York.....	9.50	9.50	8.90	8.60
Tin (Straits), New York.....	58.50	55.75	52.00	51.50
Antimony (Asiatic), N. Y.....	11.25	11.25	10.50	8.87½

Composite Price, March 11, 1924, Finished Steel, 2.746c. Per Lb.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets.....	March 4, 1924, 2.760c. Feb. 11, 1924, 2.789c. March 13, 1923, 2.710c. 10-year pre-war average, 1.689c.
These products constitute 88 per cent of the United States output of finished steel	

Composite Price, March 11, 1924, Pig Iron, \$22.86 Per Gross Ton

Based on average of basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham.....	March 4, 1924, \$22.88 Feb. 11, 1924, 22.86 March 13, 1923, 29.96 10-year pre-war average, 15.72
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rate of around 95 per cent, and taking in Johnstown and Wheeling, W. Va., the general operating rate of the greater Pittsburgh district is about 90 per cent of capacity. While the Steel Corporation subsidiaries have accumulated sufficient business to warrant a maintenance of the present rate of ingot capacity through the second quarter of the year, this is not the case with independent manufacturers, who generally are making rather big inroads upon their order books and must of necessity curtail production in the next 30 days unless there is a decided increase in new business in the meanwhile. Already there is some uneasiness on the part of independent producers about the prospect, and this has found reflection in increased price cutting. Concessions in the commoner finishes of sheets

have become so frequent that the established prices of the Steel Corporation again are maximum quotations.

Despite recent heavy orders for railroad cars, the plate market still is weak and sales at above 2.40c. base, Pittsburgh, are the exception rather than the rule. The market still exhibits considerable firmness in bars and there are no suggestions of lower prices for rails, tin plate and pipe, although in the latter product there lately has been some slowing down in the demand, due to the fact that shipments from the mill over the past two months have been so heavy that few distributors now lack a well rounded out stock.

The situation in boiler tubes still is weak, with seamless steel tubes selling at the lap welded bases and makers of the latter offering rather steep price con-

cessions to secure orders. The market does not yet show any real strength in bolts, nuts and rivets nor in strips. Extras on cold-finished steel bars are increased in a new card dated March 10, but makers have considerable tonnage on their books which escapes the extra charges because it was placed prior to that date.

Sentiment is much less optimistic than it has been. The news from Washington continues rather depressing, whether viewed from a political or a business standpoint, and doubts now are beginning to be expressed that railroad equipment buying will continue at the rate of the first two months of this year or that the year's production of automobiles would maintain the January and February gain. In structural work a more pronounced tendency toward postponement, coupled with the demands of the building trades for increased wages, makes some expect that this year will see the usual mid-summer slump in awards and that the year as a whole will not be any better than 1923.

The pig iron market has been dull to the point of almost complete stagnation and, while scrap prices are holding at about the level of a week ago, there is not enough demand to give the market any real strength. Activity is lacking in the coke market because the asking prices are above the ideas of blast furnace operators, who not only are confronted with a sluggish pig iron market but are encouraged to defer purchases because of the weak market in coal in a belief that Connellsville producers will be able to reduce costs through the setting up of lower wage scales between now and the middle of next month. The idea does not find much support here that an early attempt will be made toward unionization of the non-union districts in an effort to establish a condition that will enable union districts to compete with the non-union fields. Important Connellsville producers still are paying the Sept. 1, 1922, scales, but a number of the smaller producers already have made reductions.

Pig Iron.—There is little interest in the market on the part of consumers, and the past week has been one of the quietest that producers have ever experienced. The lack of interest is probably due more to the fact that consumers are well covered rather than because of expectation of lower prices. There is no selling pressure and consequently there is no occasion to make any change in prices from those of a week ago. We note one sale of about 2000 tons of basic iron from a western Pennsylvania furnace at a price of about \$23.25, delivered Pittsburgh, to a middle interest. Otherwise transactions have been of small tonnages and the aggregate has been very slim. The most cheerful thing about the situation is that consumers are taking all shipments and that the merchant producers are not adding to their card stocks. Recent resumption of productions at the Claire Furnace, Reliance Coke & Furnace Co., Sharpville, Pa., and of one Eliza furnace, Jones & Laughlin Steel Corporation, Pittsburgh, brings the total number of active furnaces in this and nearby districts to 112 out of 140 stacks.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being \$1.76 per gross ton:

Basic	\$22.00
Bessemer	23.50
Gray forge	22.50
No. 2 foundry	23.00
No. 3 foundry	22.50
Malleable	23.00
Low phosphorus, copper free. . .	\$29.00 to 30.00

Ferroalloys.—Steel manufacturers are buying raw materials in pretty much the same fashion that users of finished steel products are purchasing—close to actual requirements. There are no inquiries for ferroalloys of a size that would disclose whether current prices would be shaded. Agents of British makers of ferromanganese are actively soliciting business, but urge the possibility of higher prices as the reason why purchases should be made. It is claimed that \$107.50, c.i.f. Atlantic seaboard, means only \$70 back at the English furnaces, and that is too low a price to continue

in the face of rising ore prices. Buyers are not impressed in the absence of definite signs of higher prices. We make no change in ferromanganese prices, and there is not enough open market activity to establish any change in the other ferroalloys. Prices are given on page 827.

Semi-Finished Steel.—As the opening of the second quarter approaches, it grows more evident that on contracts the effort will be made to maintain present prices of \$40 for billets and slabs and \$42.50 for sheet bars, f.o.b. Pittsburgh or Youngstown. The Carnegie Steel Co. price for the second quarter on sheet bars is \$42.50, but we note the closing of one good-sized tonnage for that delivery, not by a Pittsburgh mill, at a price that figures back to about \$41.50, Pittsburgh. With the sheet market showing fresh weakness, particularly in the commoner finishes, and sales being made at \$2 a ton below the regular quotations, an attempt to secure lower prices on sheet bars by non-integrated mills may be expected, and the move may find some assistance in the fact that there is so little real strength in scrap and pig iron prices. There is no occasion to change prices of forging billets, skelp or rods, although activity is lacking in all three products, and there is more capacity than demand at present. Ingot production holds up in remarkable fashion in this district, the general average being above 90 per cent. Prices are given on page 827.

Wire Products.—While the experience of some mills is fairly satisfactory as to business, the more common report is that buyers, both jobbers and manufacturing consumers, are exercising considerable conservatism and difficulty attends accumulating backlog tonnages. Day-to-day orders are in sufficient volume to provide a fairly high rate of operation; the trouble is that if there was not some production for stock, it would be very hard to schedule the mills more than a few weeks ahead, when economical operation calls for more distant scheduling. Deliveries are good against orders, and with no signs of higher prices in the near future, the tendency of buyers is to cling to the order as distinct from the contract mode of buying. Prices are steady on all products, except coated nails, in which competition for orders is keen and prices are weak. Prices are given on page 826.

Steel Rails.—There has been no perceptible increase in the demand for light rails, since there has been no particular improvement in the coal situation, and prices still are irregular and easy. We regard 2c., base, f.o.b. mill, as the top of the market, although there are occasional sales a little above that level. Inquiries are entirely for small tonnages, and it is difficult to determine what price would be brought out by one for 500 tons or more. It is believed such a lot could be placed at 1.90c., but no such lots are offered makers at present. Rails rolled from rail steel range from 1.85c. to 1.90c.

We quote light rails: rolled from billets, 2c. to 2.15c. base (25-lb. to 45-lb.); rolled from rail steel, 1.85c. to 1.90c. base (12-lb. to 45-lb.), f.o.b. mill; standard rails, \$43 per gross ton mill, for Bessemer and open-hearth sections.

Tin Plate.—Production still is on a heavy scale, with the leading producers still running as fully as is physically possible. Specifications are heavy without any prompting on the part of manufacturers. The run now is chiefly on tin plate for packers' cans, and there is every indication that this year's pack of foods will be at least as big as that of 1923, which was a record in size. Canned tomatoes, it is figured, will be well out of wholesalers' hands before this year's pack begins, and the prospect for a big food pack this year is heightened by rains in California. Mills are striving to get as much tin plate made up as possible before hot weather takes its toll of the mill labor. The price is \$5.50 per base box, Pittsburgh, for standard coke tin plate, and stock items, which are far from plenty, command \$5.25.

Tubular Goods.—Liberal shipments over the past two months, particularly last month, when at least one maker of steel pipe set up a new high record for shipments, seem to have filled up the jobbers for the present, and there is not so heavy a demand as there was

recently. Makers are not disturbed, however, as it is figured that with the arrival of mild and open weather and a resumption of construction work, demands upon the distributors will be heavy enough to cause a sharp revival of buying. Standard pipe still is more active than oil country pipe, and most of the inquiries out for line pipe involve only small tonnages. Inquiry from the Royal Dutch Shell Co., which involves between 50,000 and 75,000 tons for a line in the Southwest, has been before the trade since last December, and apparently has not been closed because prices are above the ideas of the prospective buyer. The situation in boiler tubes still is dull and depressed, for not enough business is coming out to give all makers a share. Discounts are given on page 826.

Sheets.—While a number of makers report increased orders, it is no longer concealed that this is the result of price concessions, which in the commoner finishes now are so frequent that to fully define the market a range of prices again is necessary. The American Sheet & Tin Plate Co. continues to hold to its established prices, but among the independents, 3.75c., base, for black, 2.90c., base, for blue annealed, and 4.90c., base, for galvanized, again are the frequent, if not actually, the prevailing prices. Much of the tonnage taken by independents for the present quarter was at these prices, and evidently consumers are not so badly in need of supplies that they can be induced to pay the advances made following the heavy bookings last December. Weakness has not yet cropped out in the specialties, but it is still stated that the automobile builders, despite their high rate of production, are going along with only about three weeks' supply of sheets on hand. Prices are given on page 826.

Cold-Finished Steel Bars and Shafting.—Effective today, new cards of extras have been adopted by leading manufacturers, which increase the size extras on an average about \$2 per ton. The increase in size and other extras are not so steep as those in the hot-rolled bar card, which became effective July 1, 1923, and to which the new card of extras on cold-finished bars is a somewhat belated response. Business already on the books of makers is not affected by the change, which is to apply on business taken subsequent to today. Some time elapsed before the extras on hot-rolled bars were fully established, and this probably explains why higher extras on cold-finished bars were not formulated sooner. There is a good demand for cold-finished bars, although consumers and distributors generally are keeping their commitments within bounds of nearby requirements. Larger demands than formerly are coming from the agricultural implement manufacturers. Lately there has been no dipping below 3c., base, Pittsburgh, and it is claimed there were special reasons for the recent price of 2.90c., which was on a sale of 6000 tons to a larger motor company and had to be made to save the account to the company which took the business. Less than carload lots are priced at 3.25c., base. Ground shafting holds at 3.40c., base, f.o.b. mills for lots of a carload or more.

Track Supplies.—While makers in this district have fair-sized order books, shipments are exceeding incoming business, and sales efforts are stronger. Public quotation on large spikes range from \$3 to \$3.15, but the higher figure rules only on small lots. Demand for small spikes is almost at a standstill. Prices are given on page 826.

Bolts, Nuts and Rivets.—Bolt and nut makers are more anxious for orders than buyers are to place them, and prices still are easy since there is not enough business to give all a share. Quoted press prevail only on the small lots taken by country storekeepers. Rivets are holding rather well at quoted prices, although demands are not particularly heavy. Prices and discounts are given on page 826.

Iron and Steel Bars.—Steel bars still are resisting the weaker tendencies which lately have developed in the other heavy tonnage products. Practically all the makers in this district are holding rather firmly to 3c. base on hoops and bands and claim to be encountering very few cases where this price has been shaded in the hoop and band sizes of hot-rolled flats. Concessions are rather more frequent in strips, particularly on the

wide sizes, which are not only desirable from a tonnage standpoint, but also have to be sold at prices that practically approximate such material rolled on jobbing or small plate mills. Few makers are so well supplied with business that they do not have room for more. Prices are given on page 826.

We quote soft steel bars, rolled from billets, at 2.40c. base; bars for cold finishing of screw stock analysis, \$3 per ton over base; reinforcing bars, rolled from billets, 2.40c. base; refined iron bars, 3.25c. base, in carload lots or more, f.o.b. Pittsburgh.

Cold-Rolled Strips.—This product still is quotable from 4.75c. to 5c. base Pittsburgh, the price being governed by the tonnage involved. On small lots 5c. base is being done, but the larger tonnages are subject to much competition and on these 4.75c. base is the common figure.

Coke and Coal.—Last week's prices of furnace coke hold, but supplies are rather more ample and sales of spot tonnages at \$4.25 are not as easily made as was the case recently. The full range on spot tonnages is from \$4.15 to \$4.25 per net ton at ovens. Blast furnace interests which have not covered their second quarter requirements seem to be in no hurry to do so, evidently in the expectation of getting lower prices than now are quoted by producers. While a good deal of oven capacity still is available for second quarter tonnages, operators argue that there has been a relatively greater advance in pig iron since the end of last year than in coke, and are counting rather heavily on some big tonnages of coke for water gas manufacturers in the East to take the place of anthracite coal to take up the slack caused by any failure of the blast furnace interests to buy. Spot foundry coke holds at \$5 to \$5.50, while the market on second quarter tonnages generally is quotable from \$5.50 to \$6. Demand for coal is very limited, with supplies still excessive. Prices remain low and easy. We quote: Mine run steam coal from \$1.50 to \$2 per net ton at mines; coking grade, \$1.50 to \$2; gas coal, from \$2 to \$2.25, and slack from \$1.25 to \$1.50 for gas and \$1.15 to \$1.25 for steam.

Old Material.—The market here has grown a shade steadier since a week ago as a result of purchases by several companies and the easing in the embargo situation at several points, which has prompted some dealer buying. Sales of heavy melting steel is noted at \$20 at Midland, Pa., \$20.50 at Sharon, Pa., and at \$21 at Warren, Ohio, and Steubenville, Ohio. In general, the market still is slow, with the steel mills inclined to pursue a policy of covering only their immediate requirements. Pressure to sell, however, is moderate because the winter has been such an open one that there has been no piling up of tonnages at primary points, and consumption is at such a heavy rate that it is doubtful whether local melters can have very big stocks. Blast furnace material is not much wanted, but is not very plenty since Cleveland is taking so much of the current supply from the West. A recent offer of \$16.50 for short shoveling turnings and cast iron borings brought out very little material. Norfolk & Western Railway, J. H. Clemmitt, purchasing agent, Roanoke, Va., will take bids until noon, March 13, on 8000 gross tons of scrap iron and steel.

We quote for delivery to consumers' mill in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

Per Gross Ton	
Heavy melting steel.....	\$20.00 to \$21.00
No. 1 cast, cupola size.....	20.50 to 21.00
Rolls for rolling, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va., and Franklin, Pa.	22.50 to 23.00
Compressed sheet steel.....	18.00 to 18.50
Bundled sheets, sides and ends..	17.00 to 17.50
Railroad knuckles and couplers..	22.00 to 22.50
Railroad coil and leaf springs..	22.00 to 22.50
Low phosphorus blooms and billet ends	25.00 to 25.50
Low phosphorus plate and other material	24.00 to 24.50
Railroad malleable	18.50 to 19.00
Steel car axles.....	22.00 to 22.50
Cast iron wheels.....	20.00 to 20.50
Roller steel wheels.....	22.00 to 22.50
Machine shop turnings.....	15.00 to 15.50
Sheet bar crops.....	22.50 to 23.00
Heavy steel axle turnings.....	18.00 to 19.50
Short shoveling turnings.....	16.00 to 16.50
Heavy breakable cast.....	19.00 to 19.50
Stove plate	15.50 to 16.00
Cast iron borings	16.00 to 16.50
No. 1 railroad wrought.....	15.00 to 16.00
No. 2 railroad wrought.....	20.00 to 21.00

Chicago

Demand for Heavier Production Strong— Some Shading of Pig Iron Prices

CHICAGO, March 11.—Quiet prevails in the primary materials markets but new obligations and specifications in the heavier rolled products show no recession from the average since the first of the year. Local mills are running practically full, the Illinois Steel Co.'s operations being unchanged at 95 per cent of capacity while the Inland Steel Co. is producing at as near capacity as mechanical conditions will permit.

Among the smaller interests, the Interstate Iron & Steel Co. is substantially on a capacity basis at its alloy steel bar plant, finding it difficult to cope with the demand. Mills rolling wire products, rail steel bars and bar iron, on the other hand, are not being pressed for output. Bolt and nut plants are also disappointed at the rate of current bookings. Buying of cast iron pipe, however, has been heavy and pipe shops are well booked ahead, particularly in the smaller sizes.

The railroads and the construction industry continue to be the main source of tonnage in rolled products. Freight car buying since Jan. 1 has been at the rate of over 5000 cars a week as compared with an average of less than 2000 cars per week last year and 3500 for 1922. Specifications for rails and track supplies are heavier and buying of the latter has revived. Fabricating awards for the week are large and the amount of new construction work in prospect, principally in Chicago, involves an unusually heavy tonnage.

Pig Iron.—The market is unusually quiet and occasionally shading of prices is reported. In the main, however, Northern iron continues to bring \$24.50, base, furnace, on most of the tonnage placed. Barring several sales of 200-ton lots and a few of as high as 700 tons, buying has been confined to carlots. Southern foundry in the higher silicons has been sold in limited quantities for barge and rail shipment at a base price delivered, Chicago, which figures a few cents below that from local furnaces. The ruling market on Southern foundry for all-rail shipment remains \$23 to \$24, base, Birmingham. A Michigan melter is inquiring for 600 tons of foundry for second quarter shipment, while another user in that State is asking for figures on 500 tons of malleable for the same delivery. A Minnesota inquiry calls for 100 tons of foundry for prompt shipment. Sales of charcoal have been heavier than for some time, the largest covering 200 tons and 100 tons respectively. A Milwaukee melter is in the market for 200 to 500 tons of low phosphorus. A Michigan consumer wants a carload of 12 per cent Bessemer ferro-silicon. Notwithstanding limited new buying, shipments are going forward from furnaces at a steady rate. Deliveries from Northern furnaces in February equaled those of January, although there were two less working days than in the first month of the year. Foundry operations in this district are not uniform, but on the whole are on a satisfactory basis. Both malleable and steel foundries are commencing to accumulate heavier orders as a result of recent railroad car buying. Orders for castings from the automotive industry show no abatement.

Quotations on Northern foundry high phosphorus malleable and basic irons are f.o.b. local furnaces and do not include an average switching charge of 61c. per ton. Other prices are for iron delivered at consumers' yards or, when so indicated, f.o.b. furnace other than local.

Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago..	\$29.15
Northern coke, No. 1, sil. 2.25 to 2.75	25.00
Northern coke, foundry, No. 2, sil. 1.75 to 2.25	24.50
Malleable, not over 2.25 sil.	24.50
Basic	24.50
High phosphorus	24.50
Southern No. 2	\$29.01 to 30.01
Low phos., sil. 1 to 2 per cent, copper free	33.00 to 34.00
Silvery, sil. 8 per cent	38.29
Electric ferro-silicon, 14 to 16 per cent	45.42

Ferroalloys.—A Wisconsin melter is inquiring for two carlots of ferromanganese. There continue to be rumors of a possible advance of \$2.50 to \$5 a ton in ferromanganese, but the consensus of opinion is that there will be no change. Outside of a few carload sales of spiegeleisen, that commodity has been particularly inactive. In view of foreign offerings of as low as \$35 to \$36, New Orleans, domestic prices are more flexible.

We quote 80 per cent ferromanganese, \$115.06, delivered; 50 per cent ferrosilicon, \$75, delivered; spiegeleisen, 18 to 22 per cent, domestic, \$45.58 to \$48.58, delivered.

Plates.—Demand for plates still lags behind that for structural shapes and bars, although business showed perceptible improvement during the week and the immediate outlook is more favorable. Forty per cent of the freight cars ordered during the past week will be built in Western shops, and the plates, shapes and bars involved, amounting to 60,000 tons, will no doubt be placed with mills in this district. Renewed tank buying is also a possibility. A proposed pipe line for the Royal Dutch Shell interests from the north Texas and Oklahoma fields to the Gulf will involve from 6000 to 10,000 tons in oil storage tanks, besides a large tonnage in pipe.

The mill quotation is 2.60c., Chicago. Jobbers quote 3.30c. for plates out of stock.

Bars.—Chicago mills rolling soft steel bars are heavily booked ahead and are being pressed for deliveries by the customers, who in most instances report a progressive improvement of their business. Farm implement manufacturers, however, are probably no busier than they were at this time a year ago, although at the first of the year the outlook was regarded as more favorable. In this connection it might be remarked that it is increasingly difficult to judge activity in farm implements owing to the fact that plants in that field are steadily branching out into other lines. One important manufacturer is now making children's coaster wagons on a large scale. Another interest is preparing to make automobile rims.

Mill prices are: Mild steel bars, 2.50c., Chicago; common bar iron, 2.40c., Chicago; rail steel, 2.30c., Chicago mill.

Jobbers quote 3.20c. for steel bars out of warehouse. The warehouse quotations on cold-rolled steel bars and shafting is 4c. for rounds and 4.50c. for flats, squares and hexagons.

Jobbers quote hard and medium deformed steel bars at 2.75c. to 3c. base; hoops, 4.45c.; bands, 3.95c.

Bolts and Nuts.—Specifications are rather disappointing and prices, instead of growing firmer, are less steady. On large machine bolts the quotation of 60 and 5 off is little more than nominal and even 60 and 10 off is being shaded in some instances. Some second quarter business has been booked, but without establishing a higher level of prices.

Jobbers quote structural rivets, 3.75c.; boiler rivets, 3.95c.; machine bolts up to 3/4 x 4 in., 55 and 5 per cent off; larger sizes, 55 and 5 off; carriage bolts up to 3/4 x 6 in., 50 and 5 off; larger sizes, 50 and 5 off; hot pressed nuts, squares and hexagons, tapped, \$3.50 off; blank nuts, \$3.50 off; coach or lag screws, gimlet points, square heads, 60 and 5 per cent off.

Sheets.—Local mills are booking an encouraging volume of second quarter business and are receiving heavy specifications, cleaning up first quarter contracts. In some instances, specifications have already been sent in against second quarter contracts just closed. One of the most favorable developments is renewed pressure for shipment of blue annealed sheets to the oil fields for the fabrication of the smaller bolted oil storage tanks. Demand for this purpose had been inactive since September. Japanese inquiries for light sheets have commenced to appear, and taking due account of possible duplication, the tonnage bulks large. One important New York importer has asked for protections against a large tonnage for shipments over April, May and June. Because of their domestic obligations, local mills are unable to entertain this proposition, but are in a position to book specific tonnages in certain gages.

Mill quotations are 3.85c. for No. 28 black, 3c. for No. 10 blue annealed and 5c. for No. 28 galvanized, all being Pittsburgh prices, subject to a freight rate to Chicago of 34c. per 100 lb.

Jobbers quote f.o.b. Chicago: 4c. for blue annealed; 4.70c. for black and 5.60c. for galvanized.

Rails and Track Supplies.—A large Western line which placed orders for its 1924 rails some time ago now contemplates purchasing 25,000 tons additional.

The Rock Island program for this year includes replacing with new heavy rail 296 miles of track. Most of the tonnage required has not yet been ordered, but an early inquiry from this road is expected. Rail bookings of local mills during the week have been confined to miscellaneous sales, aggregating 2400 tons. There has been a revival in track supplies, however. Orders for angle bars, spikes and bolts and tie plates have been liberal. Notable among orders was one for 25,000 kegs of track spikes and bolts, equally divided, and another for 2000 tons of tie plates. An inquiry for 3500 tons of tie plates is pending.

Standard Bessemer and open-hearth rails, \$43; light rails, rolled from billets, 2.25c., f.o.b. makers' mills.

Standard railroad spikes, 3.10c. mill; track bolts with square nuts, 4.10c. mill; steel tie plates, 2.60c., f.o.b. mill; angle bars, 2.75c., f.o.b. mill.

Jobbers quote standard spikes out of warehouse at 3.75c. base, and track bolts, 4.75c. base.

Wire Products.—Specifications from jobbers declined during the week and although good business continues to emanate from manufacturing consumers and other sources current demand is disappointing. Ordinarily specifications at this season are in excess of production, drawing upon accumulated stocks, but such is not now the case. An encouraging development is heavy nail specifications from car builders. The railroads are also placing liberal orders for nails, no doubt largely for car repair work, and some tonnage in barbed wire.

We quote warehouse prices f.o.b. Chicago: No. 6 to No. 9 bright basic wire, \$3.90 per 100 lb.; extra for black annealed wire, 15c. per 100 lb.; common wire nails, 3.65c. to 3.80c. per 100 lb.; cement coated nails, 3.10c. to 3.25c. per keg.

Warehouse Prices.—Local jobbers have announced new extras for size on cold-rolled steel bars and shafting to conform with new cards issued by the mills. Most of the advances are in the small sizes and the extremely large sizes, while the intermediate sizes have been changed little, if any.

Structural Material.—There were a number of large fabricating awards during the week, among them an office building for the Telephone company at San Francisco, involving 5500 tons; an addition to St. Luke's Hospital, Chicago, 2600 tons, and a power plant at Tecumseh, Kan., 950 tons. An unusual amount of big work is in prospect. Bids go in on the Stevens Hotel, Chicago, involving 17,000 tons, April 2. Figures have been taken on the Lake Shore Athletic Club, requiring 6000 tons, and plans are being drawn for an addition to Hotel Sherman, also in Chicago, requiring 5000 tons. The South Dakota Highway Commission is preparing plans for a 1500-foot high bridge to be erected with Federal aid at Chamberlain, across the Missouri River. Bids have been taken on 1924 bridge requirements of the Chicago & Northwestern, aggregating 1800 tons. The projected consolidation of the Polk Street, LaSalle Street and Grand Central Railroad terminals at Chicago, an exceedingly large undertaking, was brought one step nearer by a meeting last week of all interested roads with the mayor. It will be a matter of months, or possibly a year, however, before plans can be drawn and agreed upon.

The mill quotation on plain material is 2.60c., Chicago. Jobbers quote 3.30c. for plain material out of warehouse.

Cast Iron Pipe.—Buying is on a large scale, and with pipe shops well booked ahead, particularly in 4, 6 and 8-in., on which they are committed for three months, prices are steadily growing stronger. Lettings include Illinois Golf Club, Glencoe, Ill., 175 tons to American Cast Iron Pipe Co.; Hammond, Ind., 125 tons to United States Cast Iron Pipe & Foundry Co.; private company at Lincoln, Ill., 240 tons of water and gas pipe to National Cast Iron Pipe Co. Pending work includes: Chicago, 5446 tons of 36 and 48-in., bids to be taken March 21; Michigan City, Ind., 100 tons, March 24; Manitowoc, Wis., 200 tons of 6 and 8-in. Class C, March 14; Festus, Mo., nine and one-half miles of cast iron water pipe, March 12.

We quote per net ton, f.o.b. Chicago, as follows: Water pipe, 4-in., \$60.20 to \$62.20; 6-in. to 10-in., inclusive, \$56.20 to \$58.20; 12-in. and above, \$55.70 to \$56.20; class A and gas pipe, \$5 extra.

Reinforcing Bars.—The week has been a quiet one in concrete bars, with comparatively little new tonnage

placed. The price situation is substantially unchanged and in view of the fact that no advances are in sight, prospective buyers are in no great hurry to close for their requirements. Hotel and club buildings are among the most promising prospects. Bids close March 15 on the New Palmer House, Chicago, requiring 2000 tons, and on April 1 figures will be taken on the Stevens Hotel, Chicago, requiring an equal tonnage. Figures are also about to be taken on the Union League Club Building, Chicago, the foundation work of which will require about 200 tons.

Lettings include:

Vandever Mercantile Co. building, Tulsa, Okla., 175 tons to Joseph T. Ryerson & Son.

Johannes warehouse, Green Bay, Wis., 150 tons to Concrete Engineering Co.

Cement Gun Co., Chicago, 100 tons to Barton Spiderweb System Co.

Apartment building for Frank J. Mitchell, Chicago, 100 tons to Concrete Steel Co.

Illinois and Iowa road work, 100 tons to Concrete Steel Co. Masonic Temple, St. Louis, 350 tons, to Laclede Steel Co.

Washington University, St. Louis, geology building, 100 tons, to Laclede Steel Co.

Superstructure of filter and dryer house and concrete coal pocket, Milwaukee sewage disposal plant, 500 tons. General contract let March 7 to Ed. Steigerwald & Sons, Inc., Milwaukee, at \$208,449.

Prospective business includes:

Stevens Hotel Building, Chicago, 2000 tons.

New Palmer House, Chicago, 2000 tons.

Union League Club building foundations, Chicago, 200 tons.

Four-story addition to Wisconsin Hotel, Milwaukee, Wis., 200 tons.

Kimball Trust & Savings Bank building, Chicago, 100 tons, general contract awarded to Charles B. Johnson, Chicago.

Prospective business:

Criminal Courts Building, Memphis, Tenn., 200 tons.

Arkansas Highway Commission, Little Rock, 400 tons.

Old Material.—Consumer buying has been limited to small purchases of rolling mill grades, cast and malleable scrap. Prices are soft and on numerous grades have again declined. It is observed that if scrap continues to drop, much of the outside scrap which has been coming into this market will be shut out, because the net return after deduction of freight will become too small to warrant collection or preparation.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

Iron rails	\$20.00 to \$20.50
Cast iron car wheels.....	20.50 to 21.00
Relaying rails, 56 and 60 lb.....	26.00 to 27.00
Relaying rails, 65 lb. and heavier	27.00 to 32.00
Forged steel car wheels.....	20.00 to 20.50
Railroad tires, charging box size	20.50 to 21.00
Railroad leaf springs, cut apart..	20.50 to 21.00
Rails for rerolling.....	19.50 to 20.00
Steel rails, less than 3 ft.....	21.00 to 21.50
Heavy melting steel.....	17.00 to 17.50
Frogs, switches and guards cut apart	18.00 to 18.50
Shoveling steel	17.25 to 17.75
Drop forge flashings.....	13.00 to 13.50
Hydraulic compressed sheets....	14.50 to 15.00
Axle turnings	15.50 to 16.00
Steel angle bars	19.00 to 19.50
Steel knuckles and couplers.....	20.50 to 21.00
Coil springs	21.50 to 22.00
Low phos. punchings.....	13.50 to 14.00
Machine shop turnings.....	11.50 to 12.00
Cast borings	15.00 to 15.50
Short shoveling turnings.....	15.00 to 15.50
Railroad malleable	21.00 to 21.50
Agricultural malleable	20.00 to 20.50

Per Net Ton

Iron angle and splice bars....	19.50 to 20.00
Iron arch bars and transoms....	19.50 to 20.00
Iron car axles.....	23.50 to 24.00
Steel car axles.....	19.50 to 20.00
No. 1 busheling.....	13.50 to 14.00
No. 3 busheling.....	10.00 to 10.50
Cut forge	15.00 to 15.50
Pipes and flues.....	11.50 to 12.00
No. 1 railroad wrought.....	14.50 to 15.00
No. 2 railroad wrought.....	15.00 to 15.50
No. 1 machinery cast.....	20.50 to 21.00
No. 1 railroad cast.....	19.00 to 19.50
No. 1 agricultural cast.....	19.00 to 19.50
Locomotive tires, smooth.....	17.50 to 18.00
Stove plate	16.50 to 17.00
Grate bars	16.00 to 16.50
Brake shoes	16.75 to 17.25

New York

Halting Tendency in Steel Buying—Shading in Prices—Pig Iron Unsettled

NEW YORK, March 11.—The pig iron market is in a very unsettled state. It seems clear that on any considerable tonnage recent quotations can be sharply shaded, but on carload lots and even larger tonnages, quotations are pretty well adhered to. The Massachusetts melter who has figured prominently in the market for the past two weeks has purchased at least 7500 tons, and the best information obtainable indicates that the price was \$21.25, Buffalo furnace, but the company is inquiring for an additional 7000 tons and is believed to have had an even lower quotation. Inquiries pending amount to nearly 20,000 tons, including one for 5000 tons, two for 4000 tons each, one for 3500 tons, and one for 2000 tons, but sales, with the exception of the one above mentioned, have been for small tonnages. Some melters are urging anticipation of shipments while others ask postponement. A New York agency has been offering about 400 tons of Belgian iron, silicon 2.50 to 3 per cent, at \$22.35 c.i.f. Boston, but the iron analyzes 1.80 per cent phosphorus. Foreign iron is not being considered with much favor, largely because deliveries are slow and unsatisfactory.

We quote delivered in the New York district as follows, having added to furnace price \$2.27 freight from eastern Pennsylvania, \$4.91 from Buffalo and \$.44 from Virginia:

East. Pa. No. 1X fdy., sil. 2.75 to 3.25	\$25.27 to \$25.77
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	24.77 to 25.27
East. Pa. No. 2, sil. 1.75 to 2.25	24.27 to 24.77
Buffalo, sil. 1.75 to 2.25	26.41 to 26.91
No. 2X Virginia, sil. 2.25 to 2.75	31.44
No. 2 Virginia, sil. 1.75 to 2.25	30.44

Ferroalloys.—Sales of ferromanganese by British representatives have been moderately numerous, ranging from carlots to several orders of 100 tons each at the established price of \$107.50, seaboard. Most of this was for delivery in the second quarter. Generally the market is quiet and there is no large business in sight. The spiegeleisen market is not active, but prices are unchanged. A little business has been done in both domestic and British alloy. There have been no developments in either the ferrosilicon or ferrochromium markets, specifications on contract being normal.

Cast-Iron Pipe.—While purchasing by privately owned water and gas companies continues heavy, municipal tenders have not yet begun to appear. Makers report practically full operation. We quote per net ton, f.o.b. New York, in carload lots, as follows: 6-in. and larger, \$61.60 to \$63.60; 4-in. and 5-in., \$66.60 to \$68.60; 3-in., \$76.60 to \$78.60, with \$5 additional for Class A and gas pipe. The soil pipe market is quiet, jobbers apparently being well stocked. Some hesitancy in purchasing at present is believed to result from conditions in the pig-iron market. We quote discounts of both Southern and Northern makers, f.o.b. New York, as follows: 6-in., 29½ to 30¾ per cent off list; heavy, 39½ to 40¾ per cent off list.

Warehouse Business.—In general, demand for material from stock is evidently improving slightly as spring approaches. Warehouses carrying structural material in stock report an increase in the tonnage of orders for both structural steel and plates. The schedule on black and galvanized sheets is said to be adhered to by almost all sellers in this district, shading from the basis of 4.85c. per lb. on black and 5.85c. per lb. on galvanized seldom exceeding 5.00c. per 100 lb. Effective March 10, warehouses carrying cold-finished steel and shafting have issued a revised list of extras similar to changes made by mills effective the same day. On the larger sizes a few increases in extras have been made; on the smaller, less than 1-in., increases in the extra of from 50c. to as much as \$1.50 have been made on some sizes. Demand for wrought iron and steel pipe shows a gradual increase and discounts are well maintained. We quote prices on page 842.

Finished Iron and Steel.—Steel buying is of a somewhat halting character, and the volume has diminished slightly in the past week or two. Structural steel awards and inquiries are still the outstanding features so far as large tonnages are concerned, but in this department of the steel business there is not the activity that marked the first six weeks of the year. Plates continue weak, and 2.30c., Pittsburgh, is the top price obtainable today for carloads or more, and this price has been shaded on less than 200 tons. Structural shapes are not strong, despite the fact that shape mills are much better off for orders than the plate mills. The full extent of foreign competition for American business in shapes cannot be measured until more of the foreign steel has arrived. Quite a number of steel jobbers in the East have placed orders for shapes to be imported, but practically none of this has arrived. Some is now on the way. Bar prices show virtually no change, but the larger buyers are having no difficulty in covering at 2.35c., Pittsburgh. Concrete bars are being sold at 2.30c. and less, the lower prices usually applying on hard steel bars. The New York Central Railroad has exercised options and ordered 2500 additional freight cars, making a total of 18,000 this road has bought within a few weeks. No other car business of importance has developed in the East.

We quote for mill shipments, New York delivery, as follows: Soft steel bars, 2.69c. to 2.74c.; plates, 2.64c. to 2.74c.; structural shapes, 2.69c. to 2.74c.; bar iron, 2.74c.

Coke.—Firmness continues in both foundry and furnace coke, although the market is quiet. Standard foundry is quotable at \$5.25 to \$5.75 per ton and standard furnace at \$4.25 to \$4.50 per ton. By-product is quoted at \$10.91, Newark and Jersey City, N. J.

Old Material.—The market continues quiet and prices on practically all grades weak. On heavy melting steel, \$16.50 to \$17 per ton delivered eastern Pennsylvania are the average buying prices of dealers and brokers. Machine shop turnings generally bring \$15 per ton delivered into eastern Pennsylvania, and borings and turnings are also quoted at \$15 per ton delivered. Some specification pipe is moving at \$16 per ton delivered. Stove plate is not quotable at better than \$15.50 per ton delivered to a New Jersey consumer, taking a \$2.02 freight rate, and about \$16.50 per ton delivered to a Harrisburg consumer, taking a \$3.78 freight rate. On the whole the market is so quiet that it is difficult to establish actual prices on many grades.

Buying prices per gross ton New York follow:

Heavy melting steel, yard.....	\$12.50 to \$13.00
Steel rails, short lengths, or equivalent	13.25 to 13.75
Rails for rolling.....	17.00 to 17.50
Relaying rails, nominal.....	25.00 to 26.00
Steel car axles.....	18.00 to 19.00
Iron car axles.....	25.00 to 26.00
No. 1 railroad wrought.....	16.50 to 17.00
Forge fire	11.50 to 12.00
No. 1 yard wrought, long.....	15.00 to 15.50
Cast borings (clean).....	11.25 to 11.75
Machine-shop turnings	11.25 to 11.75
Mixed borings and turnings.....	11.25 to 11.75
Iron and steel pipe (1 in. diam., not under 2 ft. long).....	11.75 to 12.25
Stove plate	13.00 to 13.50
Locomotive grate bars.....	14.00 to 14.50
Malleable cast (railroad).....	16.00 to 17.00
Cast iron car wheels.....	16.50 to 17.00

Prices which dealers in New York and Brooklyn are quoting to local foundries per gross ton follow:

No. 1 machinery cast.....	\$20.00 to \$21.00
No. 1 heavy cast (columns, building materials, etc.), cupola size	19.00 to 20.00
No. 1 heavy cast, not cupola size	15.50 to 16.50
No. 2 cast (radiators, cast boilers, etc.)	17.00 to 18.00

Case School of Applied Science, Cleveland, has established a new course in practical heat treatment of steel under the auspices of the Cleveland chapter of the American Society for Heat Treating. The course, which consists of one-hour lectures and two hours' laboratory work each evening for 20 evenings, is being given under the direction of Prof. H. M. Boylston. Several members of the Cleveland chapter of the American Society for Heat Treating will deliver lectures during the course.

Buffalo

More Activity in Pig Iron—Fair Demand for Finished Materials

BUFFALO, March 11.—The pig iron market shows evidence this week of more activity. The 10,000-ton inquiry put out by the heating apparatus manufacturers of Dunkirk and Utica was placed with a local furnace, it is understood at some concession in price. No part of the 8000-ton inquiry of a Westfield, Mass., concern noted last week is thought to have been entered on the books of local makers. Of about 12,000 tons of aggregate inquiry noted this week, one is for 5000 tons of basic iron for the Gould Coupler Co. A 4000-ton foundry inquiry is before the market from the East and a district melter wants 3000 tons of malleable. The remainder of the inquiry concerns much smaller lots. Sales for the week probably total approximately 7000 tons of all grades. The price on most of this business has been \$22 with a differential of \$22.50 for No. 2X, 2.25 to 2.75 silicon, and \$22.50 to \$23 for No. 1 iron. Some No. 2 iron of 2.25 to 2.75 silicon content has sold for \$22, it is thought.

We quote f.o.b., gross ton, Buffalo, as follows:

No. 1 foundry, sil. 2.75 to 3.25...	\$22.50 to \$23.00
No. 2 foundry, sil. 2.25 to 2.75...	22.00 to 22.50
No. 2 plain, sil. 1.75 to 2.25...	21.50 to 22.00
Basic	21.50 to 22.00
Malleable	21.50 to 22.00
Lake Superior charcoal.....	22.28

Finished Iron and Steel.—Specifications are being made in fairly satisfactory volume and mills feel that the situation is improving slowly but steadily. Bar business during the past week was a little better than it has been for many weeks. Bar mills can make deliveries in three to four weeks. The bar price, so far as is known, is remaining firm. On plates and shapes, smaller Eastern mills are doing lower than 2.50c. and this is causing other mills to dip similarly. Plate business is dull and mills which care to touch what little tonnage is moving have to compete against 2.45c. from the East. Shape business shows an improvement, but 2.40c. has been done in more than a few instances. Fabricating business is fair and early spring business promises well. Plans are out for the Liberty bank building, a 23-story structure which will probably require at least 2500 tons of steel. Sheet mills are running practically at full, with prices fairly firm, though 3.75c. for black and 4.90c. for galvanized are still being made on good-sized tonnage. Cold-rolled extras went into effect Monday. Most of the sizes show revision upward; hexagons are lower. Most cold-rolled users are covered for the second quarter on the old base. Nuts and bolts are more active. Among the week's orders was one for 300 lb. of small carriage bolts. Some users are inquiring for second quarter, and concessions from the 60 and 10 discount will probably be necessary to take this business.

We quote warehouse prices, Buffalo, as follows:

Structural shapes, 3.65c.; plates, 3.65c.; soft steel bars, 3.55c.; hoops, 4.65c.; bands, 4.35c.; blue-annealed sheets, No. 10 gage, 4.30c.; galvanized steel sheets, No. 28 gage, 6.10c.; black sheets, No. 28 gage, 5c.; cold rolled round shafting, 4.45c.

Old Material.—Business is dragging, though some dealers profess to see more activity just ahead. Embargoes have been removed from Weirton and Vandergrift, where there had been congestion. This has released some old orders and as a result Pittsburgh market is a trifle more active. A local mill has been rather active in the purchase of blast furnace scrap during the week, and has acquired several thousand tons at a price estimated between \$14.25 and \$14.50. Heavy melting steel of strictly No. 1 grade has sold as low as \$17, but this price is believed to have applied only to an occasional 500-ton lot. Other lots of heavy melting steel are believed to have brought higher prices. One mill will buy a little at \$19. Some No. 1 busheling buying has taken place; dealers are offering this material at \$15 to \$15.50. The specialty scraps have been almost entirely slowed down; some angle bars have been sold at \$21.25. Buying has dropped off considerably

and this condition is expected to prevail for the next week or ten days, at least.

We quote f.o.b., gross ton, Buffalo, as follows:

Heavy melting steel.....	\$18.00 to \$19.00
Low phos., 0.04 and under.....	22.00 to 23.00
No. 1 railroad wrought.....	16.00 to 17.00
Car wheels	20.50 to 21.00
Machine shop turnings.....	12.50 to 13.00
Cast iron borings.....	14.00 to 14.50
No. 1 busheling.....	15.00 to 15.50
Stove plate	17.50 to 18.00
Grate bars	17.50 to 18.00
Bundled sheet stampings.....	14.00 to 14.50
Hydraulic compressed	18.50 to 19.00
Railroad malleable	23.00 to 23.06
No. 1 machinery cast.....	20.00 to 20.50

Birmingham

Expected Buying of Pig Iron Not Started and Orders Are Moderate

BIRMINGHAM, ALA., March 10.—Sales of pig iron in the South are about equal to the production, which means that in filling the orders booked before the turn of the year and since then it is necessary to go to surplus piles on the furnace yards. The buying which was expected after a 10 days to two weeks lull in the market has not set in. Some effort is now being made to get in business. For a while the furnace interests of this section were abstaining from pushing the market. One of the active independent producers took in 1300 tons in orders the past week. Numerous small-lot orders, delivery in 60 to 90 days, have been booked. A few orders have been booked for third quarter, but the total tonnage is so small that it is not to be considered as a starter on that period. The quotations range from \$23 to \$24 with \$23 and \$23.50 more likely the market.

We quote per gross ton f.o.b. Birmingham district furnace as follows:

Foundry, silicon 1.75 to 2.25.....	\$23.00
Basic	23.00
Charcoal, warm blast.....	33.00

Cast-Iron Pipe.—Every indication now points to greater activity in cast-iron pipe buying in the next 30 days. The American Cast Iron Pipe Co. has received orders as follows in the last few days: Tampico, Mexico, 102 tons; Milbank, S. D., 1031 tons; Peoria, Ill., 242 tons; Decatur, Ind., 420 tons. The Birmingham pressure pipe makers are shipping their product in various directions west of the Mississippi River, the greater part of it being routed by rail, though the far Western business is finding carriage via Mobile and New Orleans and through the Panama Canal. Cast iron pipe prices remain unchanged for the time being. The soil pipe makers have been sounding possibilities recently of another advance, \$60 now being asked for standard pipe. Pressure pipe makers have bought pig iron in quantity and soil pipe manufacturers are buying in lots ranging from 500 to 750 tons.

We quote: 4-in. water, \$51 to \$52; 6-in., \$47 to \$48; 4-in. gas, \$56 to \$57; 6-in., \$52 to \$53; standard soil pipe, \$60; heavy gage, \$45.

Finished Material.—Steady operation of steel mills in the Birmingham district indicates good orders in hand or in prospect. A slight decrease is noted in the open-hearth furnace operation, but finishing mills are going well. The fabricating plants of this district are receiving contracts which are proving lucrative. Activity is noted in this direction. The Nashville Bridge Co., which last year completed a good-sized plant at Bessemer, 12 miles from Birmingham, has taken into its organization an interest of the Bessemer Coal, Iron & Land Co. (local concern), and H. L. Badham has been elected a director. This will mean further development of the plant and stronger effort for structural and general fabricating work. The Ingalls Iron Works Co., the largest fabricating plant of the district, has taken over the Johnson-Thompson Steel Co., a smaller plant, and development will be announced shortly. The Virginia Bridge & Iron Co. has started work on the fabrication of steel for the Finley yards of the Southern Railway development, a car-building

and locomotive erecting shops being proposed. Steel bars are quoted at 2.60c., Birmingham.

Coal and Coke.—Coal production in Alabama is holding up as well as could be expected. Larger companies report a steady output. Coke quotations in Alabama range between \$5 and \$6.50 per ton, with the market fairly good. No increase in production has taken place lately and there are no indications that the make is to be improved in the near future.

Old Material.—The Southern scrap iron and steel market continues quiet, though quotations show no special change the past week. Heavy melting steel still holds at \$14, stove plate at \$15.50 and No. 1 cast at \$20. Borings are held at \$9 and machine shop turnings at \$7. The chemical cast iron borings are quoted at \$15. Dealers in old material had expected a lively market as the pig iron quotations were advanced and the lull is not accounted for. Stocks are plentiful.

We quote per gross ton f.o.b. Birmingham district yards as follows:

Cast iron borings, chemical.....	\$16.00
Heavy melting steel.....	\$14.00 to 15.00
Railroad wrought.....	12.00 to 13.00
Steel axles.....	19.00 to 20.00
Iron axles.....	20.00
Steel rails.....	12.00 to 13.00
No. 1 cast.....	20.00
Tram car wheels.....	18.00 to 19.00
Car wheels.....	13.00 to 14.00
Stove plate.....	15.50 to 16.00
Machine shop turnings.....	7.00
Cast iron borings.....	9.00

St. Louis

Inquiry for Round Lot of Basic—Lower Prices in Scrap

ST. LOUIS, March 11.—The most important inquiry before the pig iron market this week is 5,000 to 10,000 tons of basic iron for second quarter delivery to an Illinois melter. There also is an inquiry for 300 tons of foundry iron for second quarter delivery to an Illinois melter. The Granite City maker, whose price is \$25.50 to \$26, f.o.b. furnace, reports the sale of 1000 tons of foundry iron, divided equally between St. Louis and East Side plants of a district melter for prompt shipment and another prompt delivery sale of 300 tons of foundry iron to an East Side melter. The Granite City maker also reports a continuation of requests for heavy anticipations against contracts. The market is firm, with Northern iron quoted at \$24.50 Chicago, and Southern iron at \$23.50 to \$24.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices \$2.16 freight from Chicago, \$3.28 from Birmingham (rail and water), \$5.17 from Birmingham, all rail, and 81 cents average switching charge from Granite City:

Northern fdy., sil. 1.75 to 2.25..	\$26.66
Northern malleable, sil. 1.75 to 2.25	26.66
Basic	26.66
Southern fdy., sil. 1.75 to 2.25 (rail)	\$28.67 to 29.17
Granite City iron, sil. 1.75 to 2.25	26.31 to 26.81

Finished Iron and Steel.—Fabricators of structural steel are looking for business. No big jobs are in sight, and the business in small tonnages is only fair in volume.

For stock out of warehouse we quote: Soft steel bars, 3.35c. per lb.; iron bars, 3.35c.; structural shapes, 3.45c.; tank plates, 3.45c.; No. 10 blue annealed sheets, 4.10c.; No. 28 black sheets, cold-rolled, one pass, 4.85c.; cold drawn rounds, shafting and screw stock, 4.70c.; structural rivets, 4.15c.; boiler rivets, 4.35c.; tank rivets, $\frac{7}{8}$ -in. and smaller, 50-5 per cent off list; machine bolts, 45-5 per cent; carriage bolts, 40-5 per cent; lag screws, 50-5 per cent; hot pressed nuts, squares or hexagons blank, \$2.50, and tapped, \$2.50 off list.

Coke.—Producers of by-product coke are living in hopes that March will remain cold so that they will be able to see their piles reduced. A little better business is reported in domestic grades. Demand for foundry coke is light.

Old Material.—The combination of heavy railroad lists and lack of buying by consumers has had the effect of causing lower prices for old material. For months consumers have been buying hand to mouth, while railroads continued to dump heavy tonnages of old material on the market. The Baltimore & Ohio

leads this week with 17,000 tons; other lists follow: Norfolk & Western, 10,000 tons; Santa Fe, 3000 tons; St. Louis & San Francisco, 2000 tons; Union Pacific, 1200 tons; Terminal Railway, St. Louis, 1200 tons; Pullman Co. 600 tons; Kansas City Southern, 500 tons; Wabash, 300 tons, and Louisville, Henderson & St. Louis, 1000 tons of relaying rails.

Iron rails	\$17.00 to \$17.50
Rails for rolling	19.50 to 20.00
Steel rails, less than 3 ft.	20.00 to 20.50
Relaying rails, 60 lb. and under..	25.00 to 26.00
Relaying rails, 70 and over.....	32.50 to 33.50
Cast iron car wheels	21.00 to 21.50
Heavy melting steel	17.00 to 17.50
Heavy shoveling steel.....	16.50 to 17.00
Frogs, switches and guards cut apart	18.50 to 19.00
Railroad springs	21.50 to 22.00
Heavy axles and tire turnings...	14.00 to 14.50
Per Net Ton	
Steel angle bars.....	16.50 to 17.00
Steel car axles	20.50 to 21.00
Iron car axles.....	27.50 to 28.00
Wrought iron bars and transoms	21.50 to 22.00
No. 1 railroad wrought.....	15.00 to 15.50
No. 2 railroad wrought.....	15.00 to 15.50
Cast iron borings.....	11.00 to 11.50
No. 1 busheling	15.00 to 15.50
No. 1 railroad cast.....	19.50 to 20.00
No. 1 machinery cast.....	19.50 to 20.00
Railroad malleable	17.00 to 17.50
Machine shop turnings.....	10.50 to 11.00
Champion bundled sheets.....	10.50 to 11.00

Boston

Price Concessions on Pig Iron—Foreign Grades Do Not Attract

BOSTON, March 11.—Details regarding the purchase of pig iron by the H. B. Smith Co., Westfield, Mass., are still lacking. Competition for the business was keen. Report has it 6000 to 7000 tons of No. 2 plain was taken divided between eastern Pennsylvania and New York State furnaces, that eastern Pennsylvania was obtained at \$21.50 furnace or \$25.16 delivered, and New York State at a price which figures back to about \$20 Buffalo furnace base. The most active Buffalo furnace in this territory, heretofore asking \$23.50 furnace for No. 1X, now quotes \$23. A central Pennsylvania furnace has advanced prices 50c. a ton to \$23 for No. 2 plain, \$23.50 for silicon 2.25 to 2.75 and \$24 for silicon 2.75 to 3.25. The only Alabama iron selling here at \$24 furnace base is high manganese, \$23 being the general price. Continental silicon 2.50 to 3.00 is offered at \$23, \$22.75 and \$22.50 c.i.f. Boston dock duty paid, and Belgian at less money. Foundries, however, show little interest in foreign or domestic iron at any price. Most of them have on hand or due sufficient first quarter iron to carry one, two or three months, and as prompt deliveries can be obtained, are in no hurry to anticipate requirements.

We quote delivered prices on the basis of the latest reported sales as follows, having added \$3.65 freight from eastern Pennsylvania, \$4.91 from Buffalo, \$5.92 from Virginia and \$9.60 from Alabama:

East Penn., sil. 2.25 to 2.75.....	\$26.15 to \$27.15
East Penn., sil. 1.75 to 2.25.....	25.65 to 26.65
Buffalo, sil. 2.25 to 2.75.....	27.41
Buffalo, sil. 1.75 to 2.25.....	26.91
Virginia, sil. 2.25 to 2.75.....	32.42 to 32.42
Virginia, sil. 1.75 to 2.25.....	31.92 to 32.92
Alabama, sil. 2.25 to 2.75.....	33.10
Alabama, sil. 1.75 to 2.25.....	32.60

Structural Steel.—Slightly more activity is reported in the fabricating market. The New England Structural Co. is awarded 1820 tons of structural steel for a local insurance company building and 800 tons for the Investors Trust Building, Worcester, Mass., and the Lehigh Structural Steel Co. 350 tons for the Providence Gas Co., Providence, R. I., office building. Bids are being taken on a bridge at Springfield, Mass., calling for 3200 tons. Plans will be out this week for an office building, School Street, Boston, requiring a round tonnage, and 1000 tons for a coal pocket gives indications of closing within a few days. The demand for plates is quiet and 2.30c., Pittsburgh base, can still be done. Bars are less active. In fact, the demand for most mill products has declined, many users carrying over considerable first quarter material into the present period. The Laconia Car Co., Laconia, N. H., has received an order for 250 box cars from the Maine Central Railroad

to cost more than \$500,000. This business represents the first equipment buying of importance by a New England carrier in some months. Required axles for the cars have not been purchased. The New England Telephone & Telegraph Co. plans to spend \$29,000,000 for cable extensions, etc.

Soft steel bars, \$3.51½ per 100 lb. base; flats, \$4.40; plain and deformed concrete bars, \$3.76½; small angles, channels and tees, \$3.51½; structural steel, large angles and beams, \$3.61½; tire steel, \$4.80 to \$5.15; open-hearth spring steel, \$5 to 8; crucible spring steel, \$12; steel bands, \$4.31½ to \$5.20; hoop steel, \$5.80 to \$6.30; cold rolled steel, \$4.35 to \$4.85; toe calk steel, \$6.15; heavy plates, \$3.61½; light plates, \$3.86½; diamond pattern plates, stock sizes, \$5.90; blue annealed sheets, \$4.51½; re-fined iron bars, \$3.51½; best refined iron bars, \$4.75; Wayne, \$5.50; Norway rounds, \$6.60; Norway squares and flats, \$7.10.

Coke.—Although running well behind those for the corresponding period last year, New England foundry specifications against first half by-product coke contracts are steadily expanding. Bookings by oven owners in February were larger than in January, and the March showing to date is better than for the first third of February. Business conditions are not due to any appreciable increase in the New England melt of iron, but largely because the inventory period is past and foundries are inclined to anticipate requirements. Both the New England Coal & Coke Co. and the Providence Gas Co. quote by-product foundry coke at \$12.50 delivered within New England. While melters in this territory continue to show little interest in Connellsville foundry coke, the scarcity of fuel in that district tends to impart underlying strength to coke made locally. A further improvement in the domestic coke situation also is a factor in the foundry fuel market.

Old Material.—An unusually wide spread in heavy melting steel prices is the outstanding feature of the market, although a general easing of prices for all material due to the lack of business is noteworthy. Two sizable orders for steel from Pittsburgh district mills at \$21 delivered represents the only new important business, other buying being covering by dealers on old orders. Strictly No. 1 steel has been bought at \$14 and \$14.50 on cars for Pittsburgh delivery. Yard steel, however, has changed hands at \$12.25, \$12.50, \$13 and \$13.60, and is offered in Worcester, Mass., at \$12.50 and \$13. Most sales of turnings reported the past week were at \$11 on cars. On a small old order for chemical borings, \$12.25 was paid. On a 100 ton order, \$12.50 is bid. Few borings are available, however, due to the inactivity of the Amoskeag Mfg. Co. plant. Cotton ties have been taken in a small way at \$11 on cars. With the general trend of prices downward, there is little inclination to force materials on the market. Rejections are in order, especially in the eastern Pennsylvania district, and price concessions of \$1 to \$2.50 have been made on these.

The following prices are for gross ton lots delivered consuming points:

No. 1 machinery cast	\$22.00 to \$22.50
No. 2 machinery cast	20.00 to 20.50
Stove plates	16.00 to 16.50
Railroad malleable	19.00 to 20.00
The following prices are offered per gross ton lots, f.o.b. Boston rate shipping points:	
No. 1 heavy melting steel	\$12.25 to \$14.50
No. 1 railroad wrought	14.00 to 14.50
No. 1 yard wrought	13.00 to 13.50
Wrought pipe (1-in. in diam., over 2 ft. long)	11.00 to 11.50
Machine shop turnings	10.50 to 11.00
Cast iron borings, chemical	12.00 to 12.50
Cast iron borings, rolling mill	11.00 to 11.50
Blast furnace borings and turnings	10.50 to 10.75
Forged scrap and bundled skeleton	10.00 to 10.50
Shafting	17.50 to 18.00
Street car axles	17.50 to 18.00
Rails for rolling	14.00 to 14.50

Dr. R. V. Wheeler, director of the British Mines Department experimental station at Eskmeals, England, who heads a party of British mining experts visiting this country, gave two public lectures at the Carnegie Institute of Technology while in Pittsburgh. One given on the evening of March 4 detailed the co-operative efforts now in progress between the American and British governmental departments toward setting up safer conditions in the mines, and the second talk given on the following evening was supplementary to the first lecture.

Cincinnati

Pig Iron and Coke Dull—Lower Prices on Old Material

CINCINNATI, March 11.—The pig iron market was exceptionally dull last week, carload sales predominating. There was, however, one sale of 400 tons of low phosphorus iron by an Eastern furnace to a melter in Dayton. A local melter bought 400 tons of foundry iron today at \$24, Iron-ton. Prices generally are unchanged, the southern Ohio market being quoted at \$23.50 to \$24 and the Southern market at \$22.50 to \$24, with sales at the latter figure reported in the near vicinity of Alabama furnaces. The only inquiry of consequence is from the Louisville & Nashville Railroad for 380 tons of various grades.

Based on freight rates of \$4.05 from Birmingham and \$2.27 from Iron-ton we quote f.o.b. Cincinnati:

Southern coke, sil. 1.75 to 2.25 (base)	\$26.55 to \$27.05
Southern coke, sil. 2.25 to 2.75 (No. 2 soft)	27.05 to 27.55
Ohio silvery, 8 per cent.	35.77
Southern Ohio coke, sil. 1.75 to 2.25 (No. 2)	25.77 to 26.27
Basic Northern	25.27
Malleable	25.77 to 26.27

Sheets.—Second quarter contracts are being made more generally, and a number of mills report good orders booked last week. The regular prices of 3c. for blue annealed, 3.85c. for black, and 5c. for galvanized are being cut \$2 per ton by a number of mills for immediate delivery, but these same mills are quoting regular prices for second quarter. Roofing sheets are in particularly good demand.

Structural Steel.—No inquiries of consequence came out during the week. The Coal Exchange Building, Huntington, W. Va., is reported to have been awarded to L. Schreiber & Sons Co. The tonnage involved is 900. No action has been taken on the Union Trust Building at Huntington, on which bids closed Wednesday, or on the Masonic Temple at Portsmouth, on which figures were taken several weeks ago.

Reinforcing Bars.—The market is rather quiet, no large inquiries appearing during the past week. The number of small inquiries shows little diminution, however, and the aggregate tonnage on inquiry is apparently satisfactory to makers. Prices are soft, and on rail steel bars it is admitted that a desirable tonnage can be placed at 2.10c., mill, with new billet stock being held at 2.30c. to 2.40c.

Warehouse Business.—Local jobbers report a considerable increase in business during the first week of March as compared with the similar period of February. Prices are being firmly held.

Cincinnati jobbers quote: Iron and steel bars, 3.50c.; reinforcing bars, 3.60c.; hoops, 4.55c.; bands, 4.25c.; shapes, 3.60c.; plates, 3.60c.; cold-rolled rounds, 4.25c.; cold-rolled flats, squares and hexagons, 4.75c.; No. 10 blue annealed sheets, 4.10c.; No. 28 black sheets, 4.80c.; No. 28 galvanized sheets, 5.55c.; No. 9 annealed wire, \$3.60 per 100 lb.; common wire nails, \$3.50 per keg base; cement coated nails, \$3.30 per keg.

Coke.—The coke market is very dull and carload sales of foundry coke constitute current activity. Prices are unchanged from last week. The Louisville & Nashville Railroad is in the market for 800 tons of foundry coke for second quarter.

Connellsville furnace, \$4.15; foundry, \$5; New River foundry, \$11; Wise County furnace, \$4.50; foundry, \$5.50; by-product foundry, \$8, Connellsville basis.

Finished Materials.—An improved demand for finished materials was in evidence during the past week. This applied more particularly to the heavier products, bars, shapes and plates. Prices of bars are holding firm, but on shapes and plates concessions are being made for attractive orders, and 2.40c. is now a pretty general quotation. Wire products are moving in better volume, and nearby mills are operating day and night forces to take care of the demand. There is no evidence of price cutting in this product. Hoops and bands continue in demand for second quarter, with 2.90c. being quoted by some mills. Track spikes are weak at 3c. Bolts and nuts are stead-

ier. Light rails, in small demand, are being held at 2c., though an attractive order would undoubtedly bring out a lower price.

Old Material.—Dealers report very light sales in Cincinnati district in scrap materials. They are, however, buying in small quantities at lower prices than last week. The market is off at least 50c. per ton.

We quote dealers' buying prices, f.o.b. cars, Cincinnati:

Per Gross Ton	
Heavy melting steel.....	\$16.00 to \$16.50
Scrap rails for melting.....	15.50 to 16.00
Short rails.....	20.00 to 20.50
Relaying rails.....	30.00 to 30.50
Rails for rolling.....	17.50 to 18.00
Old car wheels.....	15.00 to 15.50
No. 1 locomotive tires.....	16.00 to 16.50
Railroad malleable.....	18.00 to 18.50
Agricultural malleable.....	17.00 to 17.50
Loose sheet clippings.....	10.50 to 11.00
Champion bundled sheets.....	12.50 to 13.00
Per Net Ton	
Cast iron borings.....	11.00 to 11.50
Machine shop turnings.....	10.00 to 10.50
No. 1 machinery cast.....	20.00 to 20.50
No. 1 railroad cast.....	16.50 to 17.00
Iron axles.....	23.00 to 23.50
No. 1 railroad wrought.....	12.50 to 13.00
Pipes and flues.....	9.50 to 10.00
No. 1 busheling.....	11.00 to 11.50
Mixed busheling.....	9.00 to 9.50
Burnt cast.....	12.00 to 12.50
Stove plate.....	12.00 to 12.50
Brake shoes.....	13.00 to 13.50

San Francisco

Slackening in Some Directions, but General Outlook Is Favorable

SAN FRANCISCO, March 5.—Notwithstanding the fact that the iron and steel trade has had a substantial improvement since the first of the year and the development of new business has maintained a well-defined steadiness, there have been some indications of a reaction during the past week or ten days. Those most intimately connected with the trade say there has been no marked diminution in the known requirements but both mills and foundries purchased very freely during last month and in many cases in excess of their immediate needs. Hence, they are doubtless holding back to see whether the booking of new business is going to maintain its present activity or otherwise. There has been some slackening up in buying in Los Angeles and one or two contiguous counties, chiefly due to the large accumulation of materials by two of the principal plants in that section following the heavy buying of the early winter months, and that fact doubtless has some influence in shaping trade opinions in this part of the State, especially where some of the smaller establishments are always keenly on the alert for any weakening feature which might lead to temporary depression. In a general way, however, business is practically unchanged from the favorable conditions reported two weeks ago.

Pig Iron.—Buyers continue to show considerable interest in business and while there have been no large individual sales there is a very good inquiry for moderate sized lots from many quarters and the aggregate of this class of business makes up a substantial tonnage per month, so that importers are able to say that buying is of very fair volume. Prices remain steady and the previously quoted figures, \$33 to \$34 per ton, are still given out by leading importers as the ruling rates. Some foreign iron is coming to hand and it seems to be readily absorbed.

Coke.—The market has a strong undertone and sales, while not very large, are of fair proportions. Quoted rates for round lots are the same as two weeks ago, \$20 per ton for desirable foreign grades, although two sales are reported as having been made at \$21. Domestic coke sells in a moderate way at higher figures based on the Eastern price.

Finished Steel and Iron.—Business continues fairly active in nearly all branches of the trade, bars and rods probably being the easiest lines. This is not due to any slackening in the current requirements, but particularly to apprehension on the part of buyers as to offerings of foreign materials. It is stated that both French and Belgian bars and similar products are of-

fered here as low as \$2 per 100 lb., while the current figures on American made product is around \$2.80 to \$2.90. The \$2 rate is the lowest figure thus far known, although it is said that \$2.12½ was announced in the Eastern markets recently. As far as can be learned no buyer has been able to avail himself of the extremely low price for the reason that reasonably prompt delivery cannot be assured and in one case at least delivery in six months could not be definitely promised. There is a good inquiry for bolts, nuts and rivets, chiefly for export, and the requirements for this part of the State are better than at this time last year. The inquiry for structural steel continues good and there is every indication that this branch of business will increase in volume during the next three months.

Old Material.—No change worthy of note is reported, the trade situation being described as very dull but no variation in asking prices in this vicinity. The demand from Los Angeles has ceased, the local supplies there evidently being sufficient to fill current needs. For the best grade of heavy melting steel \$14, and possibly \$14.50 would be paid at present, but there is not much wanted, and for the less desirable material there is no fixed price. Consumers have all they need and they are out of the market. Business in Los Angeles is still reported very dull.

Detroit Scrap Market

DETROIT, March 11.—Melting schedules are showing a slight reduction, especially in jobbing foundries. Buyers generally are covering on pig iron and scrap to cover orders on their books. Prices are the same as quoted a week ago.

The following prices are quoted on a gross ton basis f.o.b. cars producers' yards, excepting stove plate, No. 1 machinery cast and automobile cast, which are quoted on a net ton basis:

Heavy melting steel.....	\$17.00 to \$17.50
Shoveling steel.....	16.75 to 17.25
Borings.....	12.00 to 13.00
Short turnings.....	12.00 to 13.00
Long turnings.....	10.50 to 11.00
No. 1 machinery cast.....	17.00 to 17.50
Automobile cast.....	24.00 to 25.00
Hydraulic compressed.....	15.00 to 16.00
Stove plate.....	14.00 to 15.00
No. 1 busheling.....	12.00 to 12.50
Sheet clippings.....	11.00 to 11.50
Flashings.....	12.50 to 13.50

Canadian Scrap Market

TORONTO, ONT., March 11.—Trading in iron and steel scrap has improved slightly during the past two or three weeks and it is stated that some of the larger consuming interests are buying in larger tonnages than was the case earlier in the year. Steel plants are active as a result of orders for rails and rolling stock recently placed by the Canadian National and the Canadian Pacific Railways and as a result their scrap requirements are almost back to normal again. Mills are entering the market for heavy melting steel and turnings and several large tonnage contracts have recently been placed for second quarter delivery. Dealers' buying prices are as follows:

	Gross Tons	
	Toronto	Montreal
Steel turnings.....	\$11.00	\$9.00
Machine shop turnings.....	10.00	8.00
Wrought pipe.....	9.00	11.00
Rails.....	14.00	13.00
No. 1 wrought scrap.....	12.00	13.00
Heavy melting steel.....	13.00	13.00
Steel axles.....	15.00	18.00
Axles, wrought iron.....	18.00	20.00
Net Tons		
Standard car wheels.....	15.00	15.00
Malleable scrap.....	15.00	15.50
Stove plate.....	16.00	16.00
No. 1 machinery cast.....	19.00	21.00

Conservative Policy in Mahoning Valley

YOUNGSTOWN, March 11.—New steel tonnages coming to district mills are in somewhat less volume than at this time last month, and evidences of conservatism on the part of buyers in making future commitments are appearing. In all semi-finished and finished steel lines, prices are being well sustained, and reports of concessions in competitive territory are having no effect as yet on the market in this district.

Philadelphia

Demand for Steel Products, Pig Iron and Scrap Shows Slowing Tendency

PHILADELPHIA, March 11.—The demand for all finished products and raw materials is slower than at any time since the first of the year. The pace set in the first six or eight weeks of the year in the demand for steel has not been maintained, the falling off now being plainly noticeable. Price weakness continues in the heavier steel products, and in some ways is more pronounced, particularly on plates. Except for three or four fairly substantial sales of pig iron, the market has been devoid of interesting developments in the past week.

Pig Iron.—With fairly large production and substantial stocks of iron at eastern Pennsylvania furnaces, and with the volume of buying at a low point, the iron market for this district shows elements of weakness. A New England buyer was able to purchase 7500 tons of foundry iron at price concessions, that part taken by eastern Pennsylvania furnaces, it is stated here, having been sold at \$21.50, furnace, for the base grade. Some of the tonnage is believed to have gone to Buffalo furnaces at equally low prices. The Pennsylvania Railroad bought 5000 tons of foundry grades at about \$22.50, delivered to its lines. Central and western Pennsylvania furnaces were given this tonnage. A Philadelphia cast iron pipe company bought 5000 tons and 2000 tons was sold to a Virginia cast iron pipe company by a local merchant. Other sales have been negligible, but 5000 tons of basic iron is under negotiation and will probably be bought within a day or two at \$21.50, delivered. Overproduction is the chief reason for the weakness of the eastern Pennsylvania market, nearly all furnaces having fairly heavy stocks, and while they also have substantial tonnages on order, these orders are not sufficient to use up piled stocks plus what the furnaces will make in the next two or three months. Hence there is again anxiety on the part of some furnaces to dispose of more iron and concessions are obtainable by buyers when the tonnage is attractive. The foundry iron market may be quoted at \$22.50 to \$23, furnace, with 50c. differentials for higher grades of silicon, although occasionally these differentials are being waived. Pig iron importations last week were 3000 tons from England and 1449 tons from France.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia and include freight rates varying from 76 cents to \$1.63 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	\$23.63 to \$24.13
East. Pa. No. 2X, 2.25 to 2.75 sil.	24.13 to 24.63
East. Pa. No. 1X.	24.63 to 25.13
Virginia No 2 plain, 1.75 to 2.25 sil.	30.17 to 31.17
Virginia No. 2X, 2.25 to 2.75 sil.	30.67 to 31.67
Basic delivery eastern Pa.	21.50 to 22.50
Gray forge	22.00 to 23.00
Malleable	23.75 to 24.25
Standard low phos. (f.o.b. furnace)	27.00 to 27.50
Copper bearing low phos. (f.o.b. furnace)	27.00 to 28.00

Ferromanganese.—It is reported that slight concessions on ferromanganese have been offered to buyers, though \$107.50, seaboard or furnace, remains nominally the price of both British and domestic producers.

Billets.—Producers of billets apparently have no difficulty in maintaining prices at \$40, Pittsburgh, for rerolling quality and at \$45 for forging quality. Business is in small volume.

Plates.—Eastern plate mills are not able to make any gain in operation, the tonnages booked in the past week or two showing no improvement and in some instances a loss as compared with the weeks immediately preceding. Competition for business is keener and the market is not strong at 2.30c., Pittsburgh, concessions from that price being quoted whenever the prospective order is attractive. The less-than-carload price is now 2.35c. Mill operations average about 50 per cent in the finishing departments.

Structural Material.—On the small amount of structural steel work up for bids in this district there is aggressive competition among fabricators and low prices have been offered. Prices of plain material are not firm, 2.35c., Pittsburgh, apparently being the top of the market today. Concessions from this figure are possible.

Bars.—Steel bars are quoted at 2.35c. and 2.40c., Pittsburgh, depending on the customer and the tonnage. Concrete reinforcing bars are obtainable at 2.30c., with even lower quotations of concrete bars rolled from carbon steel. Bar iron remains at 2.25c., Pittsburgh, with the demand light.

Sheets.—The situation on sheets remains unchanged, concessions of about \$2 a ton being offered by certain mills. Demand is of moderate proportions and not as brisk as a few weeks ago.

Warehouse Business.—Prices for steel products out of stock are unchanged, for local delivery being as follows:

Soft steel bars and small shapes, 3.47c.; iron bars (except bands), 3.47c.; round edge iron, 3.75c.; round edge steel, iron finished, $1\frac{1}{2}$ x $\frac{1}{2}$ in., 3.50c.; round edge steel planished, 4.30c.; tank steel plates, $\frac{1}{4}$ in. and heavier, 3.57c.; tank steel plates, $\frac{1}{2}$ in., 3.82c.; blue annealed steel sheets, No. 10 gage, 4.10c.; black sheets, No. 28 gage, 5.15c.; galvanized sheets, No. 28 gage, 6.25c.; square twisted and deformed steel bars, 3.57c.; structural shapes, 3.57c.; diamond pattern plates, $\frac{1}{4}$ -in., 5.40c.; $\frac{1}{2}$ -in., 5.60c.; spring steel, 5c.; round cold-rolled steel, 4.35c.; squares and hexagons, cold-rolled steel, 4.85c.; steel hoops, 1 in. and wider, No. 20 gage and heavier, 4.27c.; narrower than 1 in., all gages, 4.77c.; steel bands, No. 12 gage to $\frac{1}{2}$ -in., inclusive, 4.27c.; rails, 3.47c.; tool steel, 8.50c.; Norway iron, 7c.

Old Material.—The scrap market continues very dull and prices show no strengthening, with the possible exception of bundled sheets and turnings for steel works use. Efforts made by one consumer to buy these at \$14.50 have apparently not been successful for its price has been advanced to \$15. Heavy melting steel is to be had at \$17 to \$17.50, delivered.

We quote for delivery at consuming points in this district as follows:

No. 1 heavy melting steel	\$17.00 to \$17.50
Scrap rails	17.00 to 17.50
Steel rails for rolling	19.00 to 20.00
No. 1 low phos., heavy 0.04 and under	22.00 to 23.00
Couplers and knuckles	21.00 to 22.00
Cast-iron car wheels	19.00 to 20.00
Roller steel wheels	21.00 to 22.00
No. 1 railroad wrought	19.00 to 20.00
No. 1 yard wrought	17.00 to 18.00
No. 1 forge fire	15.00
Bundled sheets (for steel works)	15.00
Mixed borings and turnings (for blast furnace use)	14.50 to 15.00
Machine shop turnings (for steel works use)	15.00
Machine shop turnings (for rolling mill use)	15.00 to 15.50
Heavy axle turnings (or equivalent)	15.50 to 16.00
Cast borings (for steel works and rolling mills)	15.00 to 15.50
Cast borings (for chemical plants)	17.00 to 18.00
No. 1 cast	18.50 to 19.50
Heavy breakable cast (for steel plants)	17.00 to 17.50
Railroad grate bars	16.50 to 17.00
Stove plate (for steel plant use)	16.50 to 17.00
Railroad malleable	17.50 to 18.00
Wrought iron and soft steel pipes and tubes (new specifications)	16.00 to 16.50
Shafting	22.00 to 23.00
Steel axles	22.00 to 23.00

Youngstown Scrap Market

YOUNGSTOWN, March 11—Conditions in the scrap market are radically different from those of a month ago, when prices were trending upward. Heavy melting material has sagged to a range from \$20 to \$21, with dealers buying cautiously. A number of open hearth furnace interests in the Valley are taking regular quotas of scrap, but otherwise new buying lags.

Dealers are especially desirous of keeping their forward business down, as they do not wish to be caught with heavy supplies purchased at current prices, with the market inclined to sag. Always a speculative market, buyers and sellers are now more than usually cautious.

Compressed sheet steel is quoted at \$18 to \$18.50 in this territory.

Cleveland

Both Pig Iron and Finished Material Markets Show Little Activity

CLEVELAND, March 11.—The finished material market is dragging, with orders hardly holding up to the recent volume. However, the demand from the automobile industry continues fairly heavy. Good specifications are coming from the spring manufacturers and a Massillon spring maker has an inquiry out for 1000 to 1500 tons of spring steel. Mills are getting a fair volume of business in alloy steel. Good specifications as well as some new orders for steel bars are coming from the bolt manufacturers. General caution is still the watchword of consumers, who are placing orders only far enough in advance to secure material as needed. Virtually no contracting is being done for the second quarter and buyers see no use in making extended commitments as long as deliveries are good and there is no upward price tendency. Plates are weak and the 2.40c. price has become more common. Steel bars continue firm at 2.40c. Structural material lacks the strength of the bar market and a good sized lot might bring out a concession. The Columbia Steamship Co., Cleveland, has placed a freight boat with the Great Lakes Engineering Co. for 1925 delivery. This will require 5000 tons of plates, which will be furnished by the Carnegie Steel Co. The Baltimore & Ohio Railroad has an inquiry out for the rebuilding of 500 cars which will require 3000 tons of plates. The first large inquiry in connection with the new Union Station, Cleveland, has come out, this being for approximately 12,000 tons of sheet steel piling. No inquiry for structural material in connection with this project is expected before fall and may not come out this year. The building field is not active, but an inquiry has come out for a bank building in Buffalo requiring 2000 tons and about the same tonnage will probably be required for the Euclid-Plaza Hotel, Cleveland, a new project for which bids are expected within a few weeks. Hot rolled flat steel is not in active demand or firm in price. Hoops are quoted at 3c. and bands at 2.90c. Narrow strip steel ranges from 2.90c. to 3c., but wide strip is somewhat irregular with quotations down to 2.75c. and perhaps lower.

Pig Iron.—The volume of business has further declined, and the past week has been the dulllest for several months. Sales were very few, and none was for a lot of any size. While large consumers are mostly covered for the second quarter, some small foundries have not yet bought iron for that delivery. Many of the smaller consumers have adopted a cautious policy, and instead of buying for a full quarter's requirements, are purchasing a few carlots at a time. Although the market lacks strength, little change has developed in the price situation. The Cleveland and Valley furnaces quote foundry iron at \$23, although one Valley seller was able to get \$23.50 for a 200-ton lot for early shipment. There are reports that the \$23 Valley price has been shaded, but these lack confirmation. For Cleveland delivery, the price is unchanged at \$24 local furnace. Any softening of the Valley price below \$23 would doubtless be quickly reflected in the Cleveland market. Buffalo foundry iron is still offered at \$22, but no further sales are reported in this territory. Sales during the week include 400 tons taken by the General Electric Co. for its Erie works, this being supplemental to a round lot recently purchased. Southern foundry iron is quoted at \$23 to \$23.50, Birmingham, some producers holding to the higher base price for iron running 1.75 to 2.25 per cent silicon. The competition of foreign low phosphorus iron in the East and the \$27 Eastern furnace price is having an effect on prices for this grade in the Central West and \$29 has become the common Valley price. We note the sale of 500 tons to a Pittsburgh consumer at that price. The sale of 1000 tons of foreign low phosphorus iron to an Eastern consumer is reported at \$25, Philadelphia. In spite of the dullness, the foundry melt continues heavy and consumers are crowding furnaces for deliveries.

Quotations below, except on basic and low phosphorus iron, are delivered Cleveland, and for local iron include a 50c. switching charge. Ohio silvery and Southern iron prices are based on a \$3.02 freight rate from Jackson and \$6 rate from Birmingham:

Basic, Valley furnace.....	\$22.00
Northern No. 2 fdy., sil. 1.75 to 2.25	24.50
Southern fdy., sil. 1.75 to 2.25	\$29.00 to \$29.50
Malleable	24.50
Ohio silvery, 8 per cent.....	36.52
Standard low phos., Valley furnace	29.00

Iron Ore.—The Ford Motor Co., which recently sent out an inquiry for 250,000 tons of Lake Superior iron ore, has decided to defer buying for several weeks, or at least until after the opening market prices for the season are established. While ore men do not expect that prices will be named for about 30 days, there is a possibility that some seller will definitely announce prices any day and start a general buying movement. Nothing has developed to clear up the price situation, and the only prediction that can be made with any degree of certainty is that prices will be no higher than last year. Sellers apparently will be pretty well satisfied if they can hold to the 1923 prices. Ore shipments from Lake Erie docks during February were 502,505 tons as compared with 494,595 tons February a year ago. The balance on docks March 1 was 7,026,056 tons as compared with 7,917,984 tons on March 1, 1923.

Rails.—The Clover Leaf Railroad has placed 5000 tons of rails with the Carnegie Steel Co., 1500 tons with the Bethlehem Steel Co. and it is understood that about 1500 tons additional will go to a Chicago district mill.

Sheets.—Very few consumers are covering for the second quarter. Even the automobile industry is adopting a cautious policy in making extended commitments, although the demand from this industry continues heavy. Current orders are light and some mills are in need of tonnage, although most producers have several weeks' orders on their books. Concessions to 3.75c. on black and to 4.90c. on galvanized sheets are still being made.

Reinforcing Bars.—The market on new steel bars is firmer, with 2.40c. as the common price. It is claimed that 2.35c. is now the minimum quotation on a desirable order. New work includes Pennsylvania Railroad track elevation, Cleveland, a State hospital in Columbus and the Miami Valley Hospital, Dayton, each requiring approximately 300 tons.

Warehouse Business.—The volume of business continues fair. While regular prices are unchanged, some shading is reported on steel bars for desirable orders.

Jobbers quote steel bars, 3.36c.; plates and structural shapes, 3.46c.; No. 28 black sheets, 4.40c. to 4.65c.; No. 28 galvanized sheets, 5.60c. to 5.75c.; No. 10 blue annealed sheets, 3.60c. to 4c.; cold rolled rounds, 3.90c.; flats, squares and hexagons, 4.40c.; hoops and bands, 1 in. and wider and 20 gage or heavier, 4.16c.; narrower than 1 in. or lighter than No. 20 gage, 4.66c.; No. 9 annealed wire, \$3.50 per 100 lb.; No. 9 galvanized wire, \$3.95 per 100 lb.; common wire nails, \$3.60 base per 100 lb.

Semi-Finished Steel.—Several additional reservations for sheet bars for the second quarter taken, subject to published prices, have been made with the leading local producer who is now entirely sold up for that delivery.

Old Material.—The scrap production of several of the leading Detroit automobile plants for March was sold during the week, going mostly to dealers. Machine shop turnings are understood to have brought \$12 to \$12.25, and borings and shoveling turnings around \$12.50.

We quote dealers' prices f.o.b. Cleveland per gross ton:

Heavy melting steel.....	\$18.00 to \$18.25
Rails for rolling	18.75 to 19.00
Rails under 3 ft.	19.50 to 19.75
Low phosphorus melting	20.25 to 20.50
Cast borings	14.75 to 15.00
Machine shop turnings	14.50
Mixed borings and short turnings	14.25 to 14.50
Compressed sheet steel.....	16.25 to 16.50
Railroad wrought	14.50 to 15.00
Railroad malleable	20.75 to 21.00
Light bundled sheet stampings	13.00 to 13.50
Steel axle turnings	15.50 to 15.75
No. 1 cast	21.00 to 21.50
No. 1 bushing	13.00 to 13.25
Drop forge flashings	12.50 to 12.75
Railroad grate bars	16.75 to 17.00
Stove plate	16.75 to 17.00
Pipes and flues	12.00 to 12.50

FABRICATED STEEL BUSINESS

Chicago Hotel Projects Swell Week's Inquiries to 44,000 Tons—Awards 21,500 Tons

A new hotel to be built in Chicago and a hotel addition in that city will require a total of 22,000 tons of fabricated steel, inquiries for which have been issued within the past week. Other inquiries bring the week's total up to 44,000 tons. Awards were in larger volume than in the week preceding, totaling 21,500 tons, of which 5547 tons is for an office building in San Francisco and 3500 tons for a loft building in New York.

Loft building, Thirty-first Street, near Eighth Avenue, New York, James Stewart & Co., general contractors, 3500 tons, to Levering & Garrigues Co.

Seglin loft building, 252 West Thirty-eighth Street, New York, 600 tons, to Hay Foundry & Iron Works.

Hospital building, New York, 700 tons, to A. E. Norton, Inc.

Employers' Liability Insurance Co. building, Boston, 1800 tons, to New England Structural Steel Co.

Telephone building, Belle Harbor, Long Island, 250 tons, to Paterson Bridge Co.

United Light & Railways Co., supports for stokers and boilers at new power plant Iowa Electric Power Co., Iowana, Iowa, 294 tons, to Rock Island Bridge & Iron Co.

Illinois Power & Light Co., power plant, Tecumseh, Kan., 950 tons, to Mississippi Valley Structural Steel Co.

St. Lukes Hospital, Chicago, addition, 2653 tons, to Gage Structural Steel Works and Vanderkloot Steel Co.

Pacific Telephone & Telegraph Co., 26-story office building, San Francisco, 5547 tons, to Judson Iron Works and Pacific Rolling Mill Co.

Western Pacific Railway, five spans, Shafter, Nev., 475 tons, to Virginia Bridge & Iron Works.

Interstate highway bridge over Big Red River, North Dakota, 750 tons, to Lakeside Bridge & Steel Co.

Wisconsin Highway Commission, 150-ft. steel arch span over Sioux River, Bayfield County, 115 tons, to Wausau Iron Works.

R. Thomas & Son Co., Lisbon, Ohio, factory building, 100 tons, to Fort Pitt Bridge Works.

Acklin Stamping Co., Toledo, Ohio, factory extension, 300 tons, to Bellefontaine Bridge & Structural Co.

Elyria Iron & Steel Co., Elyria, Ohio, extension to steel plant, 250 tons, to the Fort Pitt Bridge Works.

Coal Exchange, Huntington, W. Va., 900 tons, to L. Schreiber & Sons Co.

Gas holder, Millville, N. J., 1000 tons, to Stacey Mfg. Co. Investment Trust Co., Worcester, Mass., office building, 800 tons to New England Structural Co.

Providence Gas Co., Providence, R. I., office building, 350 tons, to Lehigh Structural Steel Co.

Union Rock Co., Azusa, Cal., crushing plant, 140 tons, to Llewellyn Iron Works.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

Ashley River bascule bridge, Charleston, S. C., 1700 tons; bids close March 20.

Chesapeake & Ohio Railroad, bridge at Dayton, Ky., 400 tons.

Hotel Dennis, Atlantic City, N. J., addition, 2000 tons.

City of Springfield, Mass., highway bridges, 3300 tons; bids close March 25.

Public school buildings, New York, 3000 to 5000 tons; bids close March 11.

Loft building, 208-212 West Thirtieth Street, New York, 700 tons.

St. Thomas Aquinas Church, Bronx, New York, 200 tons.

Stevens Hotel, Chicago, 17,000 tons; bids to be taken April 2.

Town and Country Riding Club, Chicago, riding ring building, near Winnetka, Ill., 250 tons.

Chicago & North Western, 1924 bridge requirements, 1800 tons.

Bradford Corporation, Chicago, crane runway, 100 tons.

Sherman Hotel addition, Chicago, 5000 tons, plans being drawn.

Sacred Heart Home for Aged, New Bedford, Mass., 100 tons.

Niagara Falls, Lockport & Ontario Power Co., addition to towers, 400 tons.

Spaulding Fibre Co., Tonawanda, N. Y., factory building, 600 tons.

Aquinas Institute, Rochester, N. Y., addition, 300 tons.

Liberty Bank building, Buffalo, 2000 tons.

Y. W. C. A. building, Massillon, Ohio, 150 tons.

Libby Owens Sheet Glass Co. plant, Toledo, Ohio, new design, 1500 tons.

Ford Motor Co., assembly plant, Norfolk, Va., 1500 tons.

RAILROAD EQUIPMENT BUYING

New York Central Adds 2500 Freight Cars to Recent Orders, Making Total of 18,000

The New York Central has awarded orders for 2500 additional freight cars, making 18,000 which this road has ordered within the past few weeks for its own lines and that of its subsidiaries. Including the New York Central awards and 1700 freight cars for the Canadian National, the week's orders were for 5185 cars. Pending inquiries are for 1100 cars.

Louisville & Nashville has placed 100 ballast cars with the Rodger Ballast Car Co.

The Santa Fe has placed 100 air dump cars each with the Western Wheeled Scraper Co. and the Clark Equipment Co.

The Northern Refrigerator Co., Cudahy, Wis., has ordered 500 refrigerator cars from the Pullman Co.

The Great Northern has awarded 50 express refrigerator cars to the Siems Stemble Co., St. Paul.

The Norfolk & Western is inquiring for repairs on 1000 57½-ton steel gondola cars.

The Skelly Oil Co. placed 35 tank cars with the General American Tank Car Corporation.

The Burlington is inquiring for 1000 stock cars.

The Kingan Refrigerator Line, Indianapolis, contemplates purchasing 100 refrigerator cars.

The Youngstown Sheet & Tube Co. is inquiring for repairs on 500 hopper cars.

The Union Pacific has placed 20 Mallet type and 5 mountain type locomotives with the American Locomotive Co. and 10 engines of the two-ten-two type with the Baldwin Locomotive Works.

Including 500 cars each placed for its subsidiaries, the Cincinnati Northern and the Rutland, the New York Central's purchases up to date aggregate 18,000 freight cars. In addition to the orders previously reported in this column the road has placed 500 box cars with American Car & Foundry Co., 1000 hopper cars with the Pressed Steel Car Co. and 1000 automobile cars with the Standard Steel Car Co.

The Santa Fe is inquiring for 10 postal cars in addition to 40 passenger inquiries previously reported.

The Canadian National Railways have placed orders as follows: 400 box cars, 150 convertible Hart type ballast cars, 50 cabooses, 20 all-steel passenger coaches and 15 all-steel mail and express cars with the Canadian Car & Foundry Co.; 400 box cars and 20 all-steel baggage cars with the National Steel Car Corporation; 200 box cars and 500 general service freight cars with the Eastern Car Co.

The Maine Central has placed 250 box cars with the Laconia Car Co.

Sheet and Tin Workers' Wages Unchanged

YOUNGSTOWN, March 11.—Tonnage rates of sheets and tin mill workers in mid-Western properties operating under the sliding scale wage agreement of the Amalgamated Association of Iron, Steel and Tin Workers continue unchanged for the March-April period as a result of the bi-monthly examination of sales sheets Tuesday.

The examination disclosed an average price of 3.75c. per lb. on Nos. 26, 27 and 28-gage black sheets shipped during the 60-day period ended March 1, the same as the average two months ago.

The tin plate tonnage adjustment is now made on the black sheet basis, and in consequence rates of tin mill workers will remain unchanged. Rates paid workers in both divisions of the industry are now 48 per cent above base.

Sheet Mill Contract Placed

YOUNGSTOWN, March 11.—The Youngstown Sheet & Tube Co. has awarded a contract to the United Engineering & Foundry Co., Pittsburgh, for eight hot mills and six cold mills for the sheet mill plant to be erected at its Brier Hill property. Work on these mills will be pushed so as to obtain delivery as early as possible. Contracts for structural steel work to house the new mills will be awarded shortly.

City Controller Craig of New York has asked for bids for the removal of the elevated railroad spur on Forty-second Street, New York. The structure contains a fairly large tonnage of steel and several hundred tons of malleable iron. The structure must be removed by April 24.

Prices Finished Iron and Steel f.o.b. Pittsburgh

Carload Lots

Plates

Sheared, tank quality, base, per lb. 2.40c. to 2.50c.

Structural Materials

Beams, channels, etc., base, per lb. 2.40c. to 2.50c.
Sheet piling 2.65c.

Iron and Steel Bars

Soft steel bars, base, per lb. 2.40c.
Soft steel bars for cold finishing \$3 per ton over base
Reinforcing steel bars, base 2.40c.
Refined iron bars, base, per lb. 3.10c. to 3.15c.
Double refined iron bars, base, per lb. 4.75c.
Stay bolt iron bars, base, per lb. 7.75c. to 8c.

Hot-Rolled Flats

Hoops, base, per lb. 3c.
Bands, base, per lb. 3c.
Strips, base, per lb. 2.90c. to 3c.

Cold-Finished Steel

Bars and shafting, base, per lb. 3c.
Bars and shafting, l.c.r., per lb. 3.25c.
Bars, S. A. E. Series, No. 2100 4.75c.
Bars, S. A. E. Series, No. 2300 6.25c. to 6.50c.
Bars, S. A. E. Series, No. 3100 5.25c. to 5.50c.
Strips, base, per lb. 4.75c. to 5.00c.

Wire Products

(To jobbers in car lots)

Nails, base, per keg \$3.00
Galvanized nails, 1 in. and over \$2.25 over base
Galvanized nails, less than 1 in. 2.50 over base
Bright plain wire, base, No. 9 gage, per 100 lb. \$2.75
Annealed fence wire, base, per 100 lb. 2.90
Spring wire, base, per 100 lb. 3.70
Galvanized wire No. 9, base, per 100 lb. 3.35
Galvanized barbed, base, per 100 lb. 3.80
Galvanized staples, base, per keg 3.80
Painted barbed wire, base, per 100 lb. 3.45
Polished staples, base, per keg 3.45
Cement coated nails, base, per count keg \$2.60 to 2.70
Bale ties, carloads to jobbers 75 and 2 1/2 per cent off list
Woven fence, carloads (to jobbers) 67 1/2 per cent off list
Woven fence, carloads (to retailers) 65 per cent off list

Bolts and Nuts

Machine bolts, small, rolled threads, 60, 10 and 5 per cent off list
Machine bolts, all sizes, cut threads... 60 and 5 per cent off list
Carriage bolts, 3/4 x 6 in.:
Smaller and shorter, rolled threads... 60 and 5 per cent off list
Carriage bolts, cut threads, all sizes... 50, 10 and 5 per cent off list
Lag bolts 65 and 5 per cent off list
Plow bolts, Nos. 1, 2 and 3 heads... 50 and 10 per cent off list
Other style heads 20 per cent extra
Machine bolts, c.p.c. and t. nuts, 3/4 x 4 in.:
50 and 5 per cent off list
Larger and longer sizes 50 and 5 per cent off list
Hot pressed squares or hex. nuts, blank 4.25c. off list
Hot pressed nuts, tapped 4.25c. off list
C.p.c. and t. square or hex. nuts, blank 4c. off list
C.p.c. and t. square or hex. nuts, tapped 4c. off list
Semi-finished hex. nuts:
1/2 in. and smaller, U. S. S. 80 and 5 per cent off list
3/4 in. and larger, U. S. S. 75 and 5 per cent off list
Small sizes, S. A. E. 80, 10 and 5 per cent off list
S. A. E., 1/2 in. and larger 75, 10 and 5 per cent off list
Stove bolts in packages 75, 10 and 5 per cent off list
Stove bolts in bulk 75, 10, 5 and 2 1/2 per cent off list
Tire bolts 60 and 10 per cent off list
Bolt ends with hot pressed nuts 60 and 5 per cent off list
Bolt ends with cold pressed nuts 50 and 5 per cent off list
Turnbuckles, with ends, 1/2 in. and smaller, 50 to 55 and 5 per cent off list
Turnbuckles, without ends, 1/2 in. and smaller, 65 and 5 to 70 and 10 per cent off list
Washers 5c. to 5.25c. off list

Semi-Finished Castellated and Slotted Nuts

(To jobbers and consumers in large quantities f.o.b. Pittsburgh.)

Per 1000			Per 1000		
S. A. E.	U. S. S.		S. A. E.	U. S. S.	
1/4-in.	\$4.80	\$4.80	1/4-in.	\$15.00	\$15.00
3/8-in.	5.50	6.00	3/8-in.	19.50	20.00
1/2-in.	6.50	7.00	1/2-in.	28.50	28.50
3/4-in.	9.00	9.50	3/4-in.	37.00	37.50
1-in.	11.00	11.50	1-in.	58.50	60.50

Larger sizes—Prices on application.

Cap and Set Screws

Milled hex. head cap screws 75, 10 and 5 per cent off list
Milled standard set screws, case hardened 75, 10 and 5 per cent off list
Milled headless set screws, cut thread 75, 10 and 5 per cent off list
Upset hex. head cap screws, U. S. S. thread 80, 10 and 10 per cent off list
Upset hex. head cap screws, S. A. E. thread 80, 10 and 10 per cent off list
Milled studs 65 and 10 per cent off list

Rivets

Large structural and ship rivets, base, per 100 lb. \$2.75
Small rivets 70 and 10 per cent off list

Track Equipment

Spikes, 1/2 in. and larger, base, per 100 lb. \$3.00 to \$3.15
Spikes, 1/2 in., 7/8 in. and 1 in., per 100 lb. 3.25 to 3.50
Spikes, 3/4 in. 3.25 to 3.50
Spikes, boat and barge, base, per 100 lb. 3.25 to 3.50
Track bolts, 3/4 in. and larger, base, per 100 lb. 4.00 to 4.25
Track bolts, 1/2 in. and 3/4 in., base, per 100 lb. 4.50 to 5.00
Tie plates, per 100 lb. 2.60
Angle bars, base, per 100 lb. 2.75

Welded Pipe

Steel		Iron	
Inches	Black	Inches	Black
1/4	45	1/4 to 3/8	+11
1/2 to 3/4	51	1/2	22
1/2	56	3/4	28
3/4	60	1 to 1 1/2	30
1 to 3	62		
		Lap Weld	
2	55	2	23
2 1/2 to 6	59	2 1/2	26
7 and 8	56	3 to 6	28
9 and 10	54	7 to 12	26
11 and 12	53		
		Butt Weld, extra strong, plain ends	
1/4	41	2 to 3	61
1/2 to 3/4	47	3/4 to 1 1/2	+19
1/2	53	1 1/2	21
3/4	58	2	28
1 to 1 1/2	60	1 to 1 1/2	30
		Lap Weld, extra strong, plain ends	
2	53	2	23
2 1/2 to 4	57	2 1/2 to 4	29
4 1/2 to 6	56	4 1/2 to 6	28
7 to 8	52	7 to 8	21
9 and 10	45	9 to 12	16
11 and 12	44		

To the large jobbing trade the above discounts are increased by one point, with supplementary discounts of 5 per cent on black and 1 1/2 points, with a supplementary discount of 5 per cent on galvanized.

Boiler Tubes

Lap Welded Steel		Charcoal Iron	
2 to 2 1/4 in.	27	1 1/4 in.	+18
2 1/4 to 2 3/4 in.	37	1 1/4 to 1 3/4 in.	+8
3 in.	40	2 to 2 1/4 in.	2
3 1/4 to 3 3/4 in.	42 1/2	2 1/4 to 3 in.	7
4 to 13 in.	46	3 1/4 to 4 1/2 in.	9

Less carload lots 4 points less.

Standard Commercial Seamless Boiler Tubes

Cold Drawn		Hot Rolled	
1 in.	55	3 and 3 1/4 in.	36
1 1/4 and 1 1/2 in.	47	3 1/2 and 3 3/4 in.	37
1 3/4 in.	31	4 in.	41
2 and 2 1/4 in.	22	4 1/2 in. and 5 in.	33
2 1/2 and 2 3/4 in.	32		
		Hot Rolled	
3 and 3 1/4 in.	38	4 in.	43
3 1/2 in. and 3 3/4 in.	39		

Less carloads, 4 points less. Add \$8 per net ton for more than four gages heavier than standard. No extras for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be held at mechanical tube list and discount. Intermediate sizes and gages not listed take price of net larger outside diameter and heavier gage.

Seamless Mechanical Tubing

Carbon under 0.30, base \$3 per cent off list
Carbon 0.30 to 0.40, base \$1 per cent off list
Plus usual differentials and extras for cutting. Warehouse discounts range higher.

Seamless Locomotive and Superheater Tubes

Cents per Ft.		Cents per Ft.	
2-in. O.D. 12 gage	15	2 1/4-in. O.D. 10 gage	20
2-in. O.D. 11 gage	16	3-in. O.D. 7 gage	35
2-in. O.D. 10 gage	17	1 1/2-in. O.D. 9 gage	15
2 1/4-in. O.D. 12 gage	17	5 1/2-in. O.D. 9 gage	55
2 1/4-in. O.D. 11 gage	18	5 1/2-in. O.D. 9 gage	57

Tin Plate

Standard cokes, per base box \$5.50

Terne Plate

(Per Package, 20 x 28 in.)

8-lb. coating, 100 lb. base	\$11.00	20-lb. coating I. C.	\$14.90
8-lb. coating I. C.	11.30	25-lb. coating I. C.	16.20
12-lb. coating I. C.	12.70	30-lb. coating I. C.	17.35
15-lb. coating I. C.	13.95	35-lb. coating I. C.	18.35
		40-lb. coating I. C.	19.35

Sheets

Blue Annealed
Nos. 9 and 10 (base), per lb. 2.90c. to 3c.
Box Annealed, One Pass Cold Rolled
No. 28 (base), per lb. 3.75c. to 3.85c.
Automobile Sheets
Regular auto body sheets, base (22 gage), per lb. 5.35c.
Galvanized
No. 28 (base), per lb. 4.90c. to 5c.
Low Ternes
No. 28 gage (base), 8-lb. coating, per lb. 5.30c.
Tin-Mill Black Plate
No. 28 (base), per lb. 3.85c.

Prices of Raw Materials, Semi-Finished and Finished Products

Ores

Lake Superior Ores, Delivered Lower Lake Ports

Old range Bessemer, 55 per cent iron.....	\$6.45
Old range non-Bessemer, 51½ per cent iron.....	5.70
Mesabi Bessemer, 55 per cent iron.....	6.20
Mesabi non-Bessemer, 51½ per cent iron.....	5.55

Foreign Ore, per Unit, c.i.f. Philadelphia or Baltimore

Iron ore, low phos., copper free, 55 to 58 per cent iron in dry Spanish or Algerian.....	11.00c.
Iron ore, Swedish, average 66 per cent iron.....	9.50c.
Manganese ore, washed, 51 per cent manganese, from the Caucasus, nominal.....	45c.
Manganese ore, ordinary, 48 per cent manganese, from the Caucasus.....	42c.
Manganese ore, Brazilian or Indian, nominal Tungsten ore, per unit, in 60 per cent concentrates.....	42c.
Chrome ore, basic, 48 per cent Cr ₂ O ₃ , crude, per ton, c.i.f. Atlantic seaboard.....	\$8.25 to \$10.00
Molybdenum ore, 85 per cent concentrates, per lb. of MoS ₃ , New York.....	18.00 to 23.00
	75c. to 85c.

Ferroalloys

Ferromanganese, domestic, 80 per cent, furnace, or seaboard, per ton.....	\$107.50
Ferromanganese, British, 80 per cent, f.o.b. Atlantic port, duty paid.....	107.50
Ferrosilicon, 50 per cent, delivered.....	75.00
Ferrosilicon, 75 per cent.....	140.00
Ferrotungsten, per lb. contained metal.....	85c. to 90c.
Ferrochromium, 4 to 6 per cent carbon, 60 to 70 per cent Cr. per lb. contained Cr. delivered.....	10.75c.
Ferrochromium, 6 to 7 per cent carbon, 60 to 70 per cent Cr., per lb.....	10.50c.
Ferrovandium, per lb. contained vanadium.....	\$3.50 to \$4.00
Ferrocobaltitium, 15 to 18 per cent, per net ton.....	200.00

Spiegeleisen, Bessemer Ferrosilicon and Silvery Iron

(Per gross ton furnace unless otherwise stated)

Spiegeleisen, domestic, 19 to 21 per cent.....	\$38.00 to \$40.00
Spiegeleisen, domestic, 16 to 19 per cent.....	37.00 to 38.00
Ferrosilicon, Bessemer, 10 per cent, \$42.50; 11 per cent, \$45; 12 per cent, \$47.50.	
Silvery iron, 5 per cent, \$30.00; 6 per cent, \$31.00; 7 per cent, \$32.00; 8 per cent, \$33.50; 9 per cent, \$35.50; 10 per cent, \$37.50; 11 per cent, \$40.00; 12 per cent, \$42.50.	

Fluxes and Refractories

Fluorspar, 80 per cent and over calcium fluoride, not over 5 per cent silica, per net ton f.o.b. Illinois and Kentucky mines.....	\$22.00
Fluorspar, 85 per cent and over calcium fluoride, not over 5 per cent silica, per net ton f.o.b. Illinois and Kentucky mines.....	23.50
Per 1000 f.o.b. works:	
Fire Clay	
Pennsylvania.....	\$42.00 to \$45.00
Maryland.....	47.00
Ohio.....	42.00 to 43.00
Kentucky.....	42.00 to 43.00
Illinois.....	—
Missouri.....	42.00 to 45.00
Ground fire clay, per net ton.....	6.00 to 7.00
Silica Brick:	
Pennsylvania.....	\$40.00 to 42.00
Chicago.....	49.00
Birmingham.....	50.00
Ground silica clay, per net ton.....	8.00
Magnesite Brick:	
Standard size, per net ton (f.o.b. Baltimore and Chester, Pa.).....	65.00
Grain magnesite, per net ton (f.o.b. Baltimore and Chester, Pa.).....	40.00
Chrome Brick:	
Standard size, per net ton.....	47.00

Semi-Finished Steel, F.O.B. Pittsburgh or Youngstown, per gross ton

Rolling billets, 4-in. and over.....	\$40.00
Rolling billets, 2-in. and under.....	40.00
Forging billets, ordinary carbons.....	45.00
Sheet bars, Bessemer.....	42.50
Sheet bars, open-hearth.....	42.50
Slabs.....	40.00
Wire rods, common soft, base, No. 5 to ¾-in.....	51.00
Wire rods, common soft, coarser than ¾-in... \$2.50 over base	
Wire rods, screw stock.....	\$5.00 per ton over base
Wire rods, carbon, 0.20 to 0.40.....	3.00 per ton over base
Wire rods, carbon 0.41 to 0.55.....	5.00 per ton over base
Wire rods, carbon 0.56 to 0.75.....	7.50 per ton over base
Wire rods, carbon over 0.75.....	10.00 per ton over base
Wire rods, acid.....	15.00 per ton over base
Skelp, grooved, per lb.....	2.30c.
Skelp, sheared, per lb.....	2.30c.
Skelp, universal, per ton.....	2.30c.

Finished Iron and Steel, F.O.B. Mill

Rails, heavy, per gross ton.....	\$43.00
Rails, light, new steel, base, lb.....	2c. to 2.15c.
Rails, light, rerolled, base, per lb.....	1.85c. to 2.00c.
Spikes, ¾-in. and larger, base, per 100 lb....	\$3.00 to \$3.15
Spikes, ½-in. and smaller, base, per 100 lb....	3.25 to 3.50
Spikes, boat and barge, base, per 100 lb....	3.25 to 3.50
Track bolts, ¾-in. and smaller, base, per 100 lb.	4.00 to 4.25
Track bolts, ¾-in. and larger, base, per 100 lb.	4.50 to 5.00
Tie plates, per 100 lb.....	1.60
Angle bars, per 100 lb.....	2.75
Bars, common iron, base, per lb., Chicago mill	2.40c.
Bars, common iron, Pittsburgh mill.....	2.40c.
Bars, raila, steel reinforcing, base, per lb....	2.15a. to 2.25c.
Cold finished steel bars, base, Chicago, per lb..	3c.
Ground shafting, base, per lb.....	3.40c.
Cut nails, base, per keg.....	\$8.15 to \$3.25

Alloy Steel

S.A.E. Series Numbers	Bars 100 lb.
2100* (¾% Nickel, 10 to 20 per cent Carbon)...	\$3.50
2300 (3¼% Nickel).....	\$5.00 to 5.25
2500 (5% Nickel).....	7.75 to 8.00
3100 (Nickel Chromium).....	4.00 to 4.25
3200 (Nickel Chromium).....	5.75 to 6.00
3300 (Nickel Chromium).....	8.00 to 8.25
3400 (Nickel Chromium).....	7.00 to 7.25
5100 (Chromium Steel).....	3.75
5200* (Chromium Steel).....	7.50 to 8.00
6100 (Chromium Vanadium bars).....	4.75 to 5.00
6100 (Chromium Vanadium spring steel).....	4.50 to 4.75
9250 (Silico Manganese spring steel).....	3.75 to 4.00
Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chromium, 0.15 Vanadium).....	5.00 to 5.25
Chromium Molybdenum bars (0.80—1.10 Chromium, 0.25—0.40 Molybdenum).....	4.50 to 4.75
Chromium Molybdenum bars (0.50—0.70 Chromium, 0.15—0.25 Molybdenum).....	4.25 to 4.50
Chromium Molybdenum spring steel (1—1.25 Chromium, 0.30—0.50 Molybdenum).....	4.75 to 5.00

Above prices are for hot-rolled alloy steel bars, forging quality, per 100 lb., f.o.b. Pittsburgh. Billets 4 x 4 in. and larger are \$10 per gross ton less than net ton price for bars of same analyses. On smaller than 4 x 4-in. billets the net ton bar price applies.

*Not S.A.E. specifications, but numbered by manufacturers to conform to S.A.E. system.

Freight Rates

All rail freight rates from Pittsburgh on finished iron and steel products, carload lots, 36,000 lb. minimum carload, per 100 lb.:

Philadelphia, domestic.....	\$0.32	Buffalo.....	\$0.265	St. Louis.....	\$0.43	*Pacific Coast.....	\$1.15
Philadelphia, export.....	0.235	Cleveland.....	0.215	Kansas City.....	0.735	*Pac. Coast, ship plates	1.30
Baltimore, domestic.....	0.31	Cleveland, Youngstown		Kansas City (pipe)...	0.705	Birmingham.....	0.58
Baltimore, export.....	0.225	Comb.....	0.19	St. Paul.....	0.60	Memphis.....	0.56
New York, domestic.....	0.34	Detroit.....	0.29	Omaha.....	0.725	Jacksonville, all rail..	0.70
New York, export.....	0.255	Cincinnati.....	0.29	Omaha (pipe).....	0.705	Jacksonville, rail and	
Boston, domestic.....	0.365	Indianapolis.....	0.31	*Denver.....	1.15	water.....	0.415
Boston, export.....	0.255	Chicago.....	0.34	†Denver (pipe).....	1.17	New Orleans.....	0.67

*Applies minimum carload 80,000 lb. †Minimum loading 46,000 lb.

Rates from Atlantic Coast ports (i.e., New York, Philadelphia and Baltimore) to Pacific Coast ports of call on most steamship lines, via the Panama Canal, are as follows: Pig iron, 35c.; ship plates, 40c.; ingots and muck bars, structural steel, common wire products, including cut or wire nails, spikes, and wire hoops, 40c.; sheets and tin plates, 40c.; sheets No. 12 gage and lighter, 50c.; rods, 40c.; wire rope cables and strands, 45c.; wire fencing, netting and stretcher, 40c.; pipes not over 12 in. in diameter, 55c.; over 12 in. in diameter, 2½c. per in. or fraction thereof additional. All rates per 100 lb. in carload lots, minimum 36,000 lb.

NON-FERROUS METALS

The Week's Prices

Cents per Pound for Early Delivery

	Copper, New York		Straits Tin (Spot)		Lead		Zinc	
	Lake	Electro-lytic*	New York	St. Louis	New York	St. Louis	New York	St. Louis
March 5.....	14.12 1/2	13.62 1/2	56.75	9.50	9.50	7.02 1/2	6.67 1/2	
6.....	14.12 1/2	13.50	56.87 1/2	9.50	9.50	7.00	6.65	
7.....	14.25	13.62 1/2	56.62 1/2	9.50	9.50	6.97 1/2	6.62 1/2	
8.....	14.25	13.62 1/2		9.50	9.50	6.95	6.60	
10.....	14.25	13.75	57.75	9.50	9.50	6.92 1/2	6.57 1/2	
11.....	14.25	13.75	58.50	9.50	9.50	6.90	6.55	

*Refinery quotation; delivered price 1/4c. higher.

New York

NEW YORK, March 11.

The markets are generally quiet and all are firm and higher except zinc. Copper has again advanced on better demand. New high levels have been reached in the tin market, which is largely speculative. An easier tone has developed in the lead market. There is almost no demand for zinc and prices are sagging.

Copper.—A slight reaction took place in the electrolytic copper market last week and prices fell off about 1/4c. This movement did not last long, however, and due partly to statements of a decline in stocks of over 25,000,000 lb. in February and of other favorable statistical data, quotations turned upward again and today are at a minimum of 14c., delivered, which is the same level prevailing a week ago. Consumers have not fallen over themselves to obtain the metal, but there is a fair demand and there has also been an improvement in foreign buying. If production be curtailed, as seems assured, and if the reparations tangle is settled, better buying is expected from Germany and other foreign countries, accompanied by stronger markets. This seems to be the general estimate of the outlook. Some producers are confident of the future and are asking as high as 14.12 1/2c. to 14.25c., delivered. Lake copper is strong at the nominal quotation of 14.25c., delivered.

Tin.—The Straits tin market has been quieter on the surface, but sales have been fairly heavy at an estimated total of at least 1000 tons in the last week. This trading has been practically all between dealers. The fact that consumers are still out of the market creates considerable comment and there are those who believe that they cannot continue this attitude much longer. A minority, however, is of the opinion that they can refrain from buying for a considerable time yet and point to their absence from the market the greater part of last summer under somewhat similar conditions. The spot situation is acute, due largely to the delay in the arrival of steamers scheduled to reach here earlier. The premium on spot is therefore up and sales were made yesterday at 57.50c. to 58c. at the close of the market, as compared with a delivered price for April of 56.50c. The March position is about equal to the spot, which today is quoted at 58.50c., New York, in a quiet market. Today's high price is due largely to an advance in London quotations today of about £7 to £8 per ton over the prices a week ago, spot standard being quoted at £296 10s., future standard at £295 10s. and spot Straits at £298 10s. In general, futures are neglected, with the demand in the last day or two principally for spot and March metal. Arrivals thus far this month have been 985 tons, with 8670 tons reported afloat.

Lead.—The lead market is considerably quieter and there has been a distinct easing in demand for all positions. While this tendency is not yet reflected in quotations, there has been a gradual disappearance of the high levels which have been asked and obtained for certain deliveries. The leading interest continues to quote, as its contract price, 9c., New York. In the outside market quotations are not definitely established owing to the prevalence of some confusion and the absence of broadness in the market; the New York position is anywhere from 9.50c. to 9.75c., with the St. Louis level about the same, but easier in tone.

Zinc.—The reaction which set in a few weeks ago has continued and prime Western is lower at a minimum of 6.55c., St. Louis, of 6.90c., New York. There is a distinct absence in demand. This, however, is not surprising in view of the heavy buying two or three weeks ago, when the price reached a level nearly 40 points higher than that prevailing today. There has been some export inquiry which resulted in some business, but this has been light. Support from dealers and operators has been lacking.

Nickel.—Shot and ingot nickel are quoted unchanged at 29c. to 32c. per lb., with electrolytic nickel held at 32c. by the leading producers. In the outside market both shot and ingot nickel are quoted at 28c. to 32c. per lb.

Antimony.—Conditions are changed but little but prices still remain high, with wholesale lots of Chinese metal for early delivery quoted at 11.25c. to 12c., New York, duty paid.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is quoted at 27c. to 28c. per lb., duty paid, delivered, by importers who are able to obtain it from their principals.

Old Metals.—The market is active and values are advancing. Dealers' selling prices are as follows:

	Cents Per Lb.
Copper, heavy and crucible	14.00
Copper, heavy and wire	12.50
Copper, light and bottoms	11.00
Heavy machine composition	11.00
Brass, heavy	8.75
Brass, light	7.25
No. 1 red brass or composition turnings	10.00
No. 1 yellow rod brass turnings	8.25
Lead, heavy	8.375
Lead, tea	7.25
Zinc	5.00
Cast aluminum	18.50
Sheet aluminum	18.50

Chicago

MARCH 11.—Copper is stronger, although not quotably higher, and tin has advanced, while lead and zinc have declined. The situation in lead is easier and independent prices are declining toward that of the leading producer. The strength in lead has been regarded as artificial, but, notwithstanding signs of weakness, the metal is still hard to obtain for March shipment. Zinc has been affected by the London market, in fact, reductions have been made in an effort to secure export business. Among the old metals, copper and tin grades have advanced, while lead has declined. We quote in carload lots: Lake copper, 14.25c.; tin, 58.50c.; lead, 9.65c.; spelter, 6.65c.; antimony, 13.50c., in less than carload lots. On old metals we quote copper wire, crucible shapes and copper clips, 12c.; copper bottoms, 10c.; red brass, 9.50c.; yellow brass, 7.50c.; lead pipe, 7.25c.; zinc, 4.25c.; pewter, No. 1, 33c.; tin foil, 36c.; block tin, 45c.; all buying prices for less than carload lots.

Worcester Metal Trades Branch Elects Officers

The Worcester Branch, National Metal Trades Association, at its annual meeting at Worcester, Mass., re-elected Frederick Fosdick of the Fitchburg Steam Engine Co., Fitchburg, president. Other officers chosen are: Honorary president, George I. Alden, Norton Co., Worcester; vice-president, Douglas P. Cook, Boston Pressed Metal Co., Worcester; treasurer, Arthur W. Beaman, Stockbridge Machine Co., Worcester; secretary, Donald Tulloch; executive board, J. H. Drury, Union Twist Drill Co., Athol; Charles F. Marble, Curtis & Marble Machine Co., Worcester; A. Sherman Miller, Eastern Bridge & Structural Co., Worcester; John C. Spence, Norton Co.; H. H. Wright, M. S. Wright Co., Worcester; F. A. Ball, L. S. Starratt Co., Athol; Clayton O. Smith, O. S. Walker Co., Worcester; Elliott J. McKnight, L. G. Knight Co., Gardner; Charles A. Clarke, Universal Boring Machine Co., Hudson; Philip M. Morgan, Morgan Construction Co., Worcester; W. W. Shuttleworth, Warren Steam Pump Co., Warren; Joseph N. Rogers, Rogers Drop Forge Co., Rochdale; John W. Higgins, Worcester Pressed Steel Co.; Jerome R. George, Morgan Construction Co.; William H. Gates, Baldwin Chain & Mfg. Co., Worcester; Albert J. Gifford, Leland-Gifford Co., Worcester.

PERSONAL

H. W. Fernald, for many years resident manager in Boston for Rogers, Brown & Co., and considered one of the best known and informed pig iron furnace representatives in the New England territory, has severed his connection with that firm to become affiliated with Reed, Fears & Miller, Inc., Boston, New York and Philadelphia. Mr. Fernald will make his headquarters at the Boston office of the company.

Alexander Harper, general manager American Silver Co., has been made president of the Bristol Brass Corporation, Bristol, Conn., to succeed Albert F. Rockwell.

Arthur F. Woodford, for many years associated with the Sessions Foundry Co., Bristol, Conn., has been made president of the manufacturers' division of the Bristol Chamber of Commerce.

Claiborne Pirtle resigned as president of the Electric Controller & Mfg. Co., Cleveland, at the annual meeting March 4 and was elected chairman of the board. He has been with the company for 20 years. H. F. Stratton, formerly vice-president and chief engineer, was elected president and P. C. Clark, formerly secretary and treasurer, was elected vice-president. F. R. Fishback, who has been sales engineer, was made vice-president and secretary and A. G. Widdows, formerly New York sales representative, was appointed sales engineer. D. C. Wright succeeded Mr. Stratton as chief engineer. The board of directors was increased from seven to nine members by the election of Mr. Wright and Mr. Widdows.

A. H. Ellison, formerly connected with the Clyde Iron Works, Duluth, Minn., serving as Eastern manager during the last eight years, has been placed in charge of the New York and Eastern office of the Cleveland Crane & Engineering Co., crane division, with headquarters at 50 Church Street, New York.

H. H. Horsefall, general manager Canada Wire & Cable Co., is scheduled to speak on the manufacture and use of steel wire and cable at a dinner at the Engineers' Club, Toronto, April 2, of the Ontario section of the American Society of Mechanical Engineers.

Carl B. Rettig of Niles, Ohio, has been appointed general sales manager of the Waddell Steel Co., that city, headed by Jacob D. Waddell, president. Mr. Rettig has been secretary of the Niles Chamber of Commerce.

C. J. Priebe, who has been engaged during the past four years in editorial and advertising work for the *American Machinist*, has joined the sales organization of the Keller Mechanical Engineering Corporation, Brooklyn.

C. E. Reese, gas and electrical engineer, has been appointed general manager of the Bluefield Gas & Power Co., Bluefield, W. Va., by Walter Whetstone, president Southern Gas & Power Corporation. Mr. Reese has been connected with the Westinghouse Electric & Mfg. Co. as section head, stoker sales and publicity department at Philadelphia. He is a member of the American Gas Association, was formerly assistant engineer with the Illinois Public Utilities Commission, working in Springfield and Chicago, and later became associate editor of *The Gas Age* and *Gas-Age Record* and editor of the *Gas Engineering and Appliance Catalogue*, New York.

John J. Lenahan, treasurer Frank Lenahan & Sons, dealers in scrap, 53 Fulton Street, Buffalo, has been named by Supreme Court Justice O'Malley as a member of the appraisal commission of three which will value property to be condemned by the city of Buffalo for civic center purposes. Edward B. Holmes of the E. & B. Holmes Machinery Co., is another member of the commission.

R. I. Miner has accepted a position as consulting engineer for the Youngstown Pressed Steel Co. at Warren, Ohio.

R. W. Gambs, formerly with the Phoenix Iron Works, Meadville, Pa., has become associated with W. C. Runyon & Co., First National Bank Building, Pittsburgh, and will handle sales of pig iron and coke in western Pennsylvania and eastern Ohio.

L. H. Welling has been appointed Eastern manager with headquarters in New York for the Graver Corporation, East Chicago, manufacturer of tanks.

John D. Bird, who retired several months ago as general manager of the Worthington Pump & Machinery Corporation at Cudahy, suburb of Milwaukee, has been elected president of the American National Bank of Milwaukee, formerly the American Exchange Bank. E. J. Kearney, secretary-treasurer Kearney & Trecker Corporation, who has been president of the bank for three years, was elected to fill a new office of chairman of directors. Mr. Bird also is president of the Cudahy State Bank, and has been a director of the American National Bank many years. Before taking charge of the Cudahy works in 1909, he was in charge of the Worthington plant at Harrison, N. J.

T. C. Hai, secretary Chinese Industrial Mission, Shanghai, China, visited the Allis-Chalmers Mfg. Co., Milwaukee, on March 5 to inspect its works and products with special reference to generating, mining and milling machinery. Later he proceeded to Vulcan, Mich., and Duluth, Minn., to inspect mining properties, and he expects to sail March 20 from Vancouver for an inspection of industries in Japan, completing a world tour.

F. E. Finley, formerly manager of railway sales for the Laclede Steel Co., has become associated with the Kansas City Bolt & Nut Co. as district sales agent, with headquarters at St. Louis.

D. A. Polhemus has resigned as assistant to the president of the Pittsburgh Crucible Steel Co., Pittsburgh, and expects to engage in the construction business at Los Angeles, Cal. Before going with the Pittsburgh Crucible Steel Co., he was with the Carnegie Steel Co. at its Clairton, Pa., works.

George W. Way has been appointed sales manager in the Detroit district for the Union Drawn Steel Co., Beaver Falls, Pa., with offices at the company's warehouse, 237 Jos Campau Avenue. He succeeds Walter J. Bothwell, resigned.

A. D. Bach, formerly with the Cleveland office of the Atlas Steel Corporation, Dunkirk, N. Y., has become associated with Henry Disston & Sons, Inc., Philadelphia, in connection with steel sales in the New England territory. He is a graduate of Lehigh University and has been engaged in steel sales work for five years, having been associated with Wheelock, Lovejoy & Co. before going with the Atlas company.

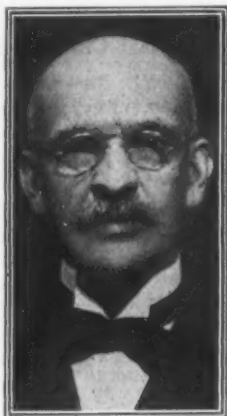
Earl L. Sparks, for about six years New England representative of the Erie Steam Shovel Co., Erie, Pa., with headquarters in Boston, has been appointed Eastern district manager of the Ohio Locomotive Crane Co., Bucyrus, Ohio, with office at 30 Church Street, New York. Prior to his connection with the Erie company, Mr. Sparks was for a number of years with the McGraw-Hill Publishing Co., New York.

Rollin K. Cheney, for several years general superintendent of the Sweet's Steel Co., Williamsport, Pa., has resigned that position to accept a similar one with Southern California Iron & Steel Co., Los Angeles, Cal. Mr. Cheney was for several years with the Jones & Laughlin Steel Co. (now Corporation), Pittsburgh, being superintendent there of the "double-storage" mills in the South Side plant.

Judge Elbert H. Gary, chairman U. S. Steel Corporation, arrived in Buenos Aires, March 6, and remained until March 12, when he started for Montevideo, Uruguay, arriving there the next day, and leaving on March 14 for Rio de Janeiro, where he is due to arrive March 18.

OBITUARY

FRANK K. CHEW, a business paper journalist well known in the sheet metal, stove, plumbing and heating fields, died at Morristown, N. J., March 8, in his sixty-seventh year. He had been continuously identified since March, 1893, with the *Metal Worker*, until some six years ago a sister publication of THE IRON AGE and since then conducted as the *Sheet Metal Worker* by the Edwin A. Scott Publishing Co., New York. He was a prodigious worker for the uplift of the trades his paper represented and took a prominent part in the affairs of the employing artisans of those trades, especially in the trade associations and allied engineering bodies. He was made an honorary member of the National Association of Sheet Metal Contractors and also of the National Warm Air Heating and Ventilating Association and was a member, almost from its beginning, of the American Society of Heating and Ventilating Engineers. He served on the board of governors of the last named organization for three years and was president for one year of the New York chapter of the society. He was active also, particularly in the early years, in the American Society of Sanitary Engineering. He was born at Salem, N. J., Feb. 2, 1858, and leaves an only son, a student at the University of Kentucky.



FRANK K. CHEW

CHARLES R. STURDEVANT, educational director of the American Steel & Wire Co., died at his home in Cleveland on March 4, from a stroke of apoplexy, aged 55 years. He had been with the Steel & Wire company since 1905 and was for several years electrical engineer in the company's Worcester, Mass., plant. He became educational director about ten years ago. This department was established to teach salesmen the various manufacturing processes, and later gave instruction to foremen and apprentices.

BURTON H. DAUGHERTY, for ten years Cleveland district sales manager of the Richards-Wilcox Mfg. Co., Aurora, Ill., died March 6, aged 54 years. He was formerly a department manager of the W. Bingham Co., Cleveland, wholesale hardware jobber.

LOWELL H. STEARNS, treasurer Fitchburg Machine Works, Fitchburg, Mass., died suddenly at his home in that city on March 3, following an attack of heart trouble. He was born at Cavendish, Vt., 66 years ago.

WILLIAM H. INMAN, who retired three years ago from the firm of Pratt & Inman, Worcester, Mass., dealers in iron and steel, died Feb. 29 at his home in that city, aged 79 years. Mr. Inman was born in Burrillville, R. I., but was educated in Worcester. In 1871 he was admitted to the firm which his father had established. He spent most of his last years in California, Florida, Maine and Massachusetts.

A. GARDINER COOPER, senior partner with H. C. Piper, in the firm of Bruce & Cook, 190 Water Street, New York, dealers in sheets, tin plate and non-ferrous metals, died suddenly March 9, at his winter home, Fort Lauderdale, Fla., aged 62 years. Mr. Cooper had been connected with Bruce & Cook for the past 44 years, entering the employ of the firm as a clerk and working up to a partnership in 1902, when he became associated with Spencer A., Philander R. and Frank C. Jennings in control of Bruce & Cook. He was born in Sag Harbor, N. Y. His early business experience was obtained

in the employ of Joseph Fahys Co., manufacturer of watch cases at Sag Harbor. Mr. Cooper was a member of the Hardware Club, New York.

LEROY BEARDSLEY, for 20 years treasurer of the Chicago Pneumatic Tool Co., Chicago, died March 5, at his home in Riverside, Ill., aged 72 years. Mr. Beardsley had been in poor health since 1918, when he retired from business.

SAMUEL W. WATKINS, formerly president National Brake & Electric Co., Milwaukee, but retired since 1910, died at his home in Clearwater, Fla., on March 1, aged 68 years. Funeral services were held in Milwaukee on March 7.

CHARLES E. STEWART, president and general manager of the James Stewart Mfg. Co., Woodstock, Ont., stove manufacturer and founder, died at the Woodstock General Hospital on Feb. 25. Mr. Stewart was born in Hamilton, Ont., in 1863, and began his commercial career with Wood, Vallance & Co., hardware merchants.

Fellowships in Mining and Metallurgy

Five fellowships for research in mining, metallurgy and ceramics are offered by the College of Mines, University of Washington, Seattle. The work is to be done in cooperation with the Bureau of Mines and the fellowships are open to graduates of universities and technical schools, who are properly qualified to undertake research investigations. The value of each fellowship is \$810 per year of 12 months, beginning July 1. Holders of the fellowships are to pay the usual tuition and part of the laboratory fees and to register as graduate students, at the same time becoming candidates for the degree of master of science in mining engineering or in metallurgy or in ceramics, unless an equivalent degree has previously been earned.

The purpose is to undertake the solution of various problems being studied by the Bureau of Mines which are of especial importance to the State of Washington, the Pacific Northwest and Alaska. The investigations consist principally of laboratory work directed largely by the bureau's technologists. For the year 1924-1925 the following subjects have been selected for investigation:

- (1) Beneficiation of coal, especially coal washing.
- (2) Electrometallurgy. Iron and steel problems. Super-refractories.
- (3) Ceramics. Super-refractories, whiteware bodies, and other problems.

Each applicant should send a copy of his collegiate record from the registrar of the college where he has been graduated or will be graduated in June. Further particulars can be obtained from the dean of the university at Seattle.

Sheet Bar Price Maintained

YOUNGSTOWN, March 11—Second quarter sheet bar tonnage will likely move with little variation at \$42.50, the price basis upon which non-integrated sheet mill rollers in the Valley are receiving tonnages. The principal sellers in this territory are the Youngstown Sheet & Tube Co., which now has a considerable surplus of production beyond its own requirements, and the Republic Iron & Steel Co.

The independent sheet steel industry in this district is maintaining production at a high rate, though some of the smaller interests are in position to accept additional tonnages of common sheets for delivery next quarter. In some cases, new business has not kept up with shipments, and a reduction in operations with certain of the Valley makers is predicted before the end of the next quarter. Most of the incoming tonnage is for fairly early delivery.

In view of the maintenance of sheet bar quotations, no change in sheet prices is indicated at an early date. Reports of price concessions are being closely followed up by district makers, in checking up the market.

Plans of New Companies

The Brennan Pen Corporation, 457 West Broadway, New York, has been incorporated with capital stock of \$600,000 to manufacture steel pens and kindred specialties. Manufacturing space has been leased and most of the machinery installed. Incorporators are J. J. Fox, J. J. Brennan and P. Fitzpatrick.

J. H. H. Voss, Inc., 154 Nassau Street, New York has been incorporated with \$100,000 capital stock to manufacture valves and other steam specialties. C. Bauer and J. H. H. Voss are the principals.

F. Maldari & Brothers, 127 Baxter Street, New York, has been incorporated with capital stock of \$25,000 and will manufacture special machinery and parts, operations having been started on a small scale. F. and A. Maldari are the principals.

The Building Equipment & Machinery Co., Freeport, N. Y., has been incorporated with capital of 1000 shares of stock, no par value, to manufacture and deal in contracting machinery, parts, etc. H. F. Pratt, L. W. Hatheway, and Dr. William H. Runcie, Freeport, head the company.

The Liberty Radio Corporation, 151 East Fifty-eighth Street, New York, has been organized with 1000 shares of stock, no par value, to manufacture wireless equipment. An outside concern will manufacture radio sets for the new company, which will direct its attention to the distribution end. The incorporators are J. J. Bernzott and L. T. Corbin.

The Shepard-Potter Co., Inc., Plattsburg, N. Y., has been incorporated with \$350,000 capital stock to manufacture electric and radio apparatus. Manufacturing processes have begun and the company will be in the market shortly for a small quantity of machine tools and a complete line of woodworking machinery for turning out cabinets in large quantities. It will take contract work on radio inductances, coupler transformers, etc. A distributing branch is maintained at 360 Madison Avenue, New York. L. Potter is president.

The H. & H. Radio Co., 514 Clinton Avenue, Newark, N. J., has been incorporated with capital stock of \$50,000 to manufacture radio equipment, but will confine immediate activities to the repair of vacuum tubes. Part of the work is done by contract, but the company contemplates building its own plant for these operations. A. P. Krumnow is president-treasurer, and H. W. Hilbert, vice-president-secretary.

The Savage Deremer Corporation, New York, recently incorporated, will act as a holding company, through which the Savage Arms Corporation, 50 Church Street, New York, will manufacture a new design of electric refrigerator. The new company will not undertake manufacturing. J. G. Deremer heads the company.

John L. Harper, vice-president and chief engineer of the Niagara Falls Power Co. and H. Birchard Taylor, vice-president William Cramp & Sons Ship & Engine Building Co., have formed Harper & Taylor, Inc., with offices at Philadelphia and Niagara Falls. The company will conduct a general engineering business, paying particular attention to the design, construction and operation of hydro-electric projects. Officers and staff will be as follows: President and general manager, H. Birchard Taylor; vice-president and chief engineer, John L. Harper; mechanical engineer, H. P. Rust; hydraulic engineer, Norman R. Gibson; electrical engineer, J. Allen Johnson; civil engineer in charge of construction, Oliver D. Dales, and civil engineer in charge of structural design, Louis S. Bernstein. The Philadelphia office will be located in the Bankers' Trust Building, and will be under the management of Henry P. Rust. The Niagara Falls office will be at 1445 Buffalo Avenue, Norman R. Gibson in charge.

The Liddell Mfg. Co., Mattituck, N. Y., has been incorporated with \$100,000 capital stock to manufacture street sweeping machinery and kindred lines. The incorporators are L. C. Fennelly, H. V. Crawford and W. A. Patterson.

The Standard Lighting Fixture Co., Brooklyn, has been incorporated with capital stock of \$100,000 and will act as dealer handling electric and gas lighting fixtures. A. A. Cohen and H. Cohen are the principals.

Wilson-Brown, Inc., 2 Rector Street, New York, has been incorporated to act as direct representative for the Bradford Machine Tool Co., the Carlton Machine Tool Co., the Cincinnati Shaper Co., the Cincinnati Gear Cutting Machine Co., all of Cincinnati, and the Liberty Machine Tool Co., Hamilton, Ohio. J. Alexander Wilson has been associated with the machine tool business in the New York territory for more than 20 years with the Pond Machine Tool Co., Plainfield, N. J., and the Vandyck Churchill Co., New York. William Brown has been connected with the Millholland

Machine Co., Indianapolis, for about nine years, having represented the company in Canada and New York.

M. C. Summers, who recently resigned as sales manager of the Superior Sheet Steel Co., Canton, Ohio, has been made president and general manager of the newly organized Thomas Steel Co., Niles, Ohio, which will manufacture black and galvanized plate. Frank Howell, formerly associated with the Canton Sheet Steel Co., Canton, will also be associated with the new firm as secretary-treasurer.

The Reiber Roofing & Sheet Metal Works, Inc., Buffalo, has been organized with \$25,000 capital stock to act as dealer in roofing and sheet metal products. Its plant has been built, but the company will be in the market from time to time for various equipment and for material up to 1/4-in. plates.

The General Shade Roller Corporation, Woolworth Building, Watertown, N. Y., has been organized to manufacture metal shade rollers. Some small parts may be let out to contract, but the company will have its own plant and will install punch presses and spring making machines. Will Orick heads the company.

The Dreis & Krump Mfg. Co., 2909-23 South Halsted Street, Chicago, has awarded contracts for a new plant to be built at Seventy-fourth and Loomis Streets, Chicago. The main building will be 100 x 260 ft., with a two-story addition 30 x 60 ft. Structural contract covering 130 tons has been awarded to the New City Iron Works, Chicago. The company expects to occupy the new plant about June 1 and will use it in manufacturing bending plates, angle benders, splitting shears and overhead track.

The Murray Products Co., Clay and St. Aubin Avenues, Detroit, has been organized as a sales branch of the J. W. Murray Mfg. Co., manufacturer of sheet metal parts, steel furniture and like products.

The Reliance Electric Co., 225 Federal Street, Camden, N. J., has been organized with \$50,000 capital stock to act as wholesale distributor of electrical supplies. M. Buzley is president.

The Cushion Grip Break Co., Lexington, Ky., has been organized to manufacture corrugated springs to be used on Ford transmissions. Contract for the first installment has been let to the Dunbar Brothers Co., Bristol, Conn., but the new company will finance the installation of machinery necessary for manufacturing. F. A. Forsythe is manager.

The Brake Service Co., Johnstown, Pa., has been organized with nominal capital to reline and adjust brakes. B. B. Segal is president.

The Thompson Spring Corporation, Wilmington, Del., has been incorporated with \$1,750,000 capital stock to manufacture shock absorbers and hydraulic snubbers. It has a plant sufficiently equipped for 500,000 units per year. No equipment will be needed at the present, but the company will be in the market from time to time for steel tubing, round and hexagon stock, and also for malleable and brass castings. P. J. Carroll is general manager.

The Weigel-Brown Iron Works, Inc., with factories at Detroit and Hamilton, Ohio, and offices at 2175 Bellevue Avenue, Detroit, has been incorporated with \$45,000 capital stock to manufacture structural steel for building, ornamental iron, bronze, brass and wire works. It has recently completed a new factory and equipment has been placed. John A. Weigel is president; George E. Brown, secretary-treasurer; Carl A. Weigel, vice-president and general manager.

The MacKay Co., Billings, Mont., has been organized to act as wholesaler and retailer in farm implements and supplies. W. D. MacKay is president.

The Buffalo Sintering Corporation, with works at Buffalo, and offices at 86 East Randolph Street, Chicago, has been organized with \$250,000 capital stock to refine metal ores. It plans to erect a new building which is being designed by the American Ore Reclamation Co., contracts for which have not yet been let. The plant will involve a small amount of structural steel. W. S. Reed is vice-president.

The Michael-George Co., Inc., Grand Haven, Mich., has been incorporated with \$75,000 capital stock to manufacture pen and ink pencils, having taken over the business of two companies engaged in this line. Construction has been completed on a building and contracts for machinery have been placed. G. M. Kraker is one of the heads.

The Mack Radio Corporation, care of Bush & Bush, 1128 Black Building, Los Angeles, Cal., has been organized with \$50,000 capital stock to assemble radio parts. Manufacturing will be undertaken later on.

The Herr Dump Car Mfg. Co., Lancaster, Pa., has been organized with \$200,000 capital stock to manufacture side dump bodies for motor trucks. Plans are not yet perfected. A. L. Herr heads the company.

Earl Radio Service, Inc., 272 Main Street, Hackensack, N. J., has been organized to act as dealer in radio products. Ralph E. Earl, Jr., is president.

Bippart-Hunkele, Inc., 24-26 Mechanic Street, Newark, N. J., has been organized to deal in power equipment and to operate a repair plant. C. H. Bippart is treasurer.

The Ledger Plate Co., Conrad, Mont., has been organized with \$50,000 capital stock to manufacture ledger plates for farm equipment. Negotiations are now under way to manufacture on a royalty basis, but if this fails parts will be made by contract. F. C. Robertson is secretary.

The Kalman Steel Co., Chicago, incorporated with capital stock of \$2,000,000, is a consolidation of the Corrugated Bar Co. of Boston and the Kalman Steel Co. of Chicago. Plants will be maintained at Boston, New York, Chicago, Atlanta, Ga., Philadelphia, Minneapolis and Youngstown, Ohio.

The Industrial Supply Co., care of Albert Eichhorn, 401 West Lombard Street, Baltimore, has been organized to manufacture and deal in machinery, but operations will not be started for a time. H. E. Clark is president and W. O. Ratcliffe, vice-president.

Jennings, Smith & Lee, Inc., 321 Winthrop Avenue, New Haven, Conn., has been organized with \$50,000 capital stock to manufacture window screens, tool chests, screen doors, cabinets, etc. At present the company is leasing a plant and would like to receive information regarding materials and equipment from manufacturers. Walton Smith is treasurer.

The Dirigold Corporation, 728 Metropolitan Bank Building, Minneapolis, Minn., has been incorporated with \$1,100,000 capital stock, Delaware laws, to manufacture tools and machinery, specializing in dirigold and alcobronz. It has not been decided whether to build a plant or lease, nor has the matter of equipment been determined. The company has a well equipped factory now in operation in Sweden. Its American factory will likely be situated in Minneapolis. Victor J. Wallin is vice-president.

The City Foundry Co., 1834 Broad Street, Hartford, Conn., has been organized with \$50,000 capital stock to manufacture non-ferrous metal castings, specializing in bearing bronze and aluminum match plates and patterns. Manufacturing will be done by contract, but no awards have been let as yet. The company may build its own plant later on. C. A. Belanger is president and W. W. Wright, vice-president and treasurer.

The Universal Battery Corporation of America, 790 Winona Avenue, Detroit, has been organized as a holding company to license the manufacture of a new compartment battery box. F. E. Turrell is treasurer.

The Kapaciton Co., care of Arthur T. Dear, 15 Exchange Place, Jersey City, N. J., has been incorporated with \$200,000 capital stock to manufacture radio parts, specializing in mica condensers. Its plans are not definitely known.

The Standard Radio Corporation, Trenton, N. J., has been incorporated with capital stock of \$50,000 to manufacture and distribute radio equipment. Manufacturing will not be undertaken immediately. A. Numbers is president.

The Industrial Gas Equipment Co., 508 State Street, New Haven, Conn., has been incorporated with capital stock of \$100,000 to manufacture various industrial heating appliances, including the Reeves gas-air pre-mixer, inspirators, burners, tips, furnaces and the like. A plant has been leased and equipment installed adequate for present needs. The company will buy raw material in the nature of tin plate, bronze castings, etc. F. I. Newton is secretary.

The Cosmos Electric Plant & Supply Co., 5917 Bartmer Street, St. Louis, has been organized with \$30,000 capital stock to act as dealer in electrical equipment. J. Carter Carstens is president; W. H. Spear, vice-president, and V. P. Gabriel, secretary-treasurer.

The Nu-Way Player Roll Machine Co., New Orleans, has been organized with \$30,000 capital stock to manufacture music roll perforating and printing machines. Plans for manufacturing are not fully decided, but it is likely that work will be done by contract. Joseph J. Darilla, 1930 Art Street, heads the company.

Trade Changes

The Dale Machinery Co., Chicago, has been appointed exclusive representative in Chicago territory for the Western Machine Tool Co., Holland, Mich., manufacturer of radial drills.

The E. L. Essley Machinery Co., Chicago, has been appointed exclusive representative in Chicago territory for the Wilmarth & Morman Co., Grand Rapids, Mich., manufacturer of grinding machines.

The offices of the Saco-Lowell Shops, 77 Franklin Street, Boston, have been moved to the eleventh floor of the new First National Bank Building, 1 Federal Street.

The Corrugated Bar Co., Boston, and the Kalman Steel

Co., Chicago, have consolidated under the firm name of Kalman Steel Co. The Boston fabricating plant will be enlarged and plants maintained at New York, Philadelphia, Atlanta, Youngstown, Chicago and Minneapolis. The consolidation is capitalized for \$2,000,000.

The M. D. Larkin Corporation, Dayton, has purchased the controlling interest in the Dayton Iron & Steel Co., jobber of iron and steel products. No changes are contemplated in the personnel of the company.

The Hamilton Pump & Tank Co., Hamilton, Ohio, recently organized, will act as a selling organization for lubricating outfits put on the market by the Hamilton Welding & Mfg. Co. The latter company has completed installation of equipment to double its capacity of oil pumps and tanks.

The Furnace Engineering Co., 315 Adams Avenue, Detroit, has been organized as agent for the installation for Hart & Crouse warm air furnaces. It will operate a shop for the manufacture of sheet metal products, used in connection with the installations. Equipment has been supplied. J. L. Fuller is president; C. Dorr, vice-president, and S. Laffrey, secretary-treasurer.

Standard Steel & Wire Co., Chicago, has moved general offices from 549 West Washington Boulevard to 1408 Courtland Street.

The Melrose, Standard Silica Co., Chicago, has changed its name to the Standard Silica Co.

The Columbia Steel Equipment Co., manufacturer of filing cabinets, has moved general offices to 841 Chestnut Street, Philadelphia.

Harry M. Allen, 30 Church Street, New York, has changed its name to the H. F. Allen Co., Inc.

The United Alloy Steel Corporation has opened a Cincinnati office at 421 First National Bank Building, in charge of B. A. Apperson and L. E. Kittle.

Henry Potts & Co., Real Estate Trust Building, Philadelphia, have moved to 1610 Bankers Trust Building, Walnut and Juniper Streets.

The New York office at 120 West Thirty-second Street of the Reynolds Electric Co., manufacturer of motors and motor-driven appliances, has been moved to 129 West Thirty-first Street. C. W. Ellis is in charge.

The Dunning Compressor Co., Holmesburg, Philadelphia, manufacturer of small capacity air compressors, has appointed Arthur Appleton, 29 Broadway, New York, as agent in the New York district.

The United Alloy Steel Corporation, Canton, Ohio, has opened a Syracuse, N. Y., branch at 402 Keith Theatre Building, in charge of F. W. Krebs.

Under the management of Walter de Fries, the Combustion Utilities Corporation, a subsidiary of the H. L. Doherty interests, has opened a Pittsburgh district office to furnish to the fuel consuming industries industrial heating apparatus ranging from a small oven furnace to an open-hearth or malleable iron installation. At present the Pittsburgh office is located in rooms 966-968, Union Trust Building.

Several steel companies have leased space in the 32-story Straus Building at Michigan Avenue and Jackson Boulevard, Chicago, which is nearing completion. These include the Youngstown Pressed Steel Co., Russell, Burdall & Ward Bolt & Nut Co., Verona Tool Works, Pittsburgh Steel Co., Pittsburgh Steel Products Co., Miami Metals Co. and the National Steel Fabric Co.

The American Steel & Wire Co. has moved its general office and sales office in Cleveland from the Western Reserve Building to the Rockefeller Building. A little later two other United States Steel Corporation sales offices in Cleveland, those of the American Sheet & Tin Plate Co. and the American Bridge Co., will be moved to the Rockefeller Building, bringing all the Cleveland sales offices of the various Corporation units together in one building.

The E. H. Caldwell & Son Co., heavy hardware, machinery, agricultural implements, Corpus Christi, Tex., ended their hardware career of over 40 years on Dec. 31, when the stock of merchandise was sold complete to the Krueger Machinery Co. of San Antonio, Tex., which will continue the Caldwell business in connection with its San Antonio house. The sale enabled the retiring company to give a most satisfactory settlement to all creditors. Mr. Caldwell announces that he will rest a while before going into mercantile business.

The Pittsburgh office of the Niles-Bement-Pond Co. will be moved from 425 Seventh Avenue to 503 Liberty Avenue, Empire Building, on April 1.

The Glow-Brite Co., Cleveland, has changed its name to Ever Glow Co.

The McMyler-Interstate Co., Cleveland, has moved its Chicago branch office into new and larger quarters at 648 Railway Exchange Building.

Machinery Markets and News of the Works

HESITANCY MARKS TRADE

Many Inquiries for Machine Tools Being Received, but Buying Is Slow

Standard Sanitary Mfg. Co., Pittsburgh, Places Orders for 23 Tools for New Plant at Baltimore

Hesitation still marks machine-tool buying. If inquiries were a gage of conditions the market might be said to be active, but the fact is that only a small proportion of the inquiries develop into orders. For one reason or another manufacturers postpone buying, and it is a case of hope deferred for machine-tool builders and dealers.

The most important purchase of the week was 23 tools for the new Baltimore plant of the Standard Sanitary Mfg. Co., Pittsburgh. Most of this business went to one company, which put in a lump-sum bid. The Gravity Carburetor Co., Cleveland, placed orders for \$40,000 worth of tools. Additional orders were placed by the Studebaker Corporation for its South Bend, Ind., plant.

Inquiries for 43 tools have been issued by the Santa Fé Railroad, bringing its pending list up to 168 tools. This and the list of the Southern Railway, published a few weeks ago, are the largest railroad buying in prospect.

New York

NEW YORK, March 11.

NOTWITHSTANDING the large number of inquiries, the local machine-tool trade reports no increase in orders. The prevailing impression among sellers of tools is that better business is going to develop, but the spirit of hesitancy among manufacturers makes it difficult at present to bring those in need of equipment to the buying frame of mind. Uncertainty as to developments at Washington with relation to tax revision and the oil investigation, the lack of strength in raw material markets, together with the fact that few manufacturers are able to book orders very far ahead are the factors which are given to explain the slowness of the machine-tool market to gain momentum.

There has been no important buying within the past week. Taking all of the Eastern districts together, the Buffalo territory has shown more activity than any section. There is a great deal of interest in that locality in the possible entrance of the Pierce-Arrow Motor Car Co., Buffalo, into the small car field, an expansion of that company's activities which has been under consideration for some time. If the company decides to build a small, moderate-priced automobile, a good-sized list of machine tools will be required. In the crane industry the largest order is that of the Southern Railway for about a dozen cranes for its new shops at North Birmingham.

The Radio Corporation of America, 64 Broad Street, New York, has plans for a three-story plant, 50 x 100 ft., on site recently acquired at South Park and Van Cortlandt Avenues,

to cost in excess of \$100,000. Clinton Mackenzie, 119th Street, is architect.

The Clemson Saw Co., 20 Cottage Street, Middletown, N. Y., has awarded a contract to the Miller Reed Co., 103 Park Avenue, New York, for a one and one-half story addition, to cost \$80,000. D. G. Canfield, 11 Linden Place, is architect.

The Doehler Die-Casting Co., Court and Ninth streets, Brooklyn, is disposing of a stock issue totaling \$1,584,000, a portion of the proceeds to be used for expansion in connection with the recent acquisition of branch plants at Batavia, N. Y., and Pottstown, Pa. H. H. Doehler is president.

The Board of Contract and Supply, Albany, N. Y., is planning the purchase of two 10-ton tractors for municipal service. L. W. Herzog is commissioner of public works.

The Consolidation Coal Co., 67 Wall Street, New York, is arranging for a preferred stock issue of \$10,000,000, a portion of the proceeds to be used for extensions in properties, installation of electric power and other equipment.

The Grymes Engineering Co., 17 Battery Place, New York, has acquired the plant of the Standard Milling Co. at Mariners Harbor, S. I., totaling about 215,000 sq. ft. of floor area, for a new works.

The Transit Commission, 49 Lafayette Street, New York, has plans for the construction of an electrical repair shop at the Coney Island yards of the municipal transit system, and will soon take bids. Other shops and buildings will be erected later, the entire project to involve close to \$9,000,000 with equipment.

The Wilson Welder & Metals Co., 132 King Street, New York, manufacturer of welding equipment, etc., has leased property at the Hoboken Terminal, Hoboken, N. J., for a new plant.

The Industrial Machinery Division, Room 814, Bureau of Foreign and Domestic Commerce, Washington, will receive catalogs and information regarding machinery for cleaning lubricating oil after it has been used, for the office of the Trade Commissioner of the department at Manila, P. I., which has received requests for such American equipment, reference 314, 12/14.

The Universal Car & Sales Corporation, 434 Jackson Avenue, Long Island City, is taking bids for a one- and two-story parts, assembling and repair plant, 100 x 130 ft., on Jackson Avenue. I. Kaufer is president.

The Majestic Machine & Tool Co., 197 Grand Street, New York, has leased a floor in the building at 342 West Fourteenth Street for extensions in its works.

Work will commence on a six-story automobile service and repair building at 195-99 Fulton Street, New York, estimated to cost \$400,000 with equipment, for which plans have been drawn by Charles N. Whinston & Co., 2 Columbus Circle, architects. The owner's name will be announced later.

The Paulsboro Water Co., Paulsboro, N. J., will take bids until March 20 for a steel standpipe, 25 ft. in diameter and 110 ft. high; 70 gate valves; valve extension boxes; 5 tons of special castings; cast iron pipe, 4 to 8 in. diameter, and other material for extensions. George Pfeiffer, Jr., 37 East Walnut Avenue, Merchantville, N. J., is engineer. B. G. Paul is secretary.

The Dunellen Ice Co., Dunellen, N. J., has plans for a one- and two-story ice-manufacturing plant, 100 x 100 ft., for which bids are being asked on a general contract. Frank H. Quinby, 110 William Street, New York, is architect.

The Commissioner of Institutions and Agencies, State Office Building, West Hanover Street, Trenton, N. J., will take bids until March 26 for a complete boiler plant of about 1700 hp. capacity for the New Jersey State Hospital, Morris Plains, including boiler units, pumping equipment, stack and other equipment, as per plans and specifications at the office of the Division of Architecture and Construction of the Department.

The Public Service Electric Co., Jersey City, N. J., has filed plans for the construction of a two-story addition to its power house at 153-55 Culver Avenue, estimated to cost \$40,000.

The International Motor Corporation, 1449 West Front Street, Plainfield, N. J., has awarded a contract to the Barney-Ahlers Construction Corporation, 110 West Fortieth

Street, New York, for two four-story additions, 85 x 225 ft., and 75 x 150 ft., to cost \$350,000.

The A. A. Wire Co., 199 Sussex Avenue, Newark, manufacturer of rubber covered electrical wires, etc., has leased the former plant of the New Jersey Tube Works, Harrison, N. J., with option to purchase. It consists of eight one-story buildings, totaling about 160,000 sq. ft. of floor space. Possession will be taken Sept. 1, the present works moved to the new location and additional equipment installed.

The United States Tool Co., Inc., 117 Mechanic Street, Newark, manufacturer of wireless equipment and tools, has leased property at 78-80 Mechanic Street, for a new plant, primarily for the production of radio apparatus.

The Metallurgical & Chemical Corporation, Matawan, N. J., has broken ground for new buildings, to cost \$45,000 including equipment.

The Marbelike Mfg. Co., Newark, manufacturer of lamp bases, standards, etc., has leased space in the building at 22-24 Prospect Street, and will take immediate possession for a new plant. William Field is president, and Max Buskin, secretary.

Kraeuter & Co., Inc., 563 Eighteenth Avenue, Newark, N. J., is in the market for a bar cutter of capacity to cut 4-in. square steel bars, and preferably up to .40 carbon steel.

The Helwig Welding & Repair Co., 1370 Springfield Avenue, Irvington, N. J., recently incorporated to operate an electric welding plant, will soon be in the market for a large electric welder and also for a spring furnace. William Nicoll is secretary-treasurer.

Philadelphia

PHILADELPHIA, March 10.

THE C. H. Wheeler Mfg. Co., Eighteenth and Lehigh Streets, Philadelphia, manufacturer of pumping equipment, water apparatus, etc., has awarded a contract to the Robert E. Lamb Co., 843 North Nineteenth Street, for a one-story addition.

The Bureau of Supplies and Accounts, Navy Department, Washington, will take bids until March 25 for 400 seamless boiler tubes for the Philadelphia Navy Yard, schedule 1960.

H. S. Getty & Co., Inc., 1539 Cabot Street, Philadelphia, manufacturer of hardware products, is having plans drawn for a one-story machine shop, 40 x 80 ft., to cost \$75,000. Walker & Carswell, 1015 Chestnut Street, are architects.

The Philadelphia Electric Co., Tenth and Chestnut Streets, Philadelphia, is arranging for a stock issue of \$10,000,000, a portion of the proceeds to be used for extensions in generating plants and system.

Frank V. Nickels, 15 South Twenty-first Street, Philadelphia, architect, has plans for an eight-story automobile service and repair building, 100 x 150 ft., to cost \$375,000 with equipment. The owner's name is temporarily withheld.

The Haines, Jones & Cadbury Co., 1136 Ridge Street, Philadelphia, manufacturer of plumbing fixtures and equipment, has called bids on a general contract for its proposed factory branch at Wilkes-Barre, Pa., to cost \$80,000. McCormick & French, Wilkes-Barre, are architects.

The Godfrey Roller Co., 1219 Race Street, Philadelphia, manufacturer of printers' rollers, etc., has awarded a general contract to the A. Raymond Raff Co., 1635 Thompson Street, for the erection of a new plant at Camac and Spring Streets, to cost \$50,000.

The Metalweld Service Corporation, 1435 North Thirty-first Street, Philadelphia, will commence the erection of a new welding and machine works at Fox Street and Hunting Park Avenue, to cost \$75,000, for which a general contract has been let to the A. Raymond Raff Co., 1635 Thompson Street.

The Philadelphia & Reading Railway Co., Reading Terminal, Philadelphia, has preliminary plans and surveys under way for the electrification of its line from St. Clair to Frackville, Pa., estimated to cost \$1,500,000, including automatic power substations, line equipment, etc.

Manual training equipment will be installed in the two-story senior and junior high school to be erected at Midland, Pa., estimated to cost \$300,000, for which plans are being prepared by W. G. Eckles, Lawrence Savings & Trust Building, New Castle, Pa., architect.

Oliver H. Hewitt, Hollidaysburg, Pa., and associates have acquired the plant of the Glass Casket Corporation, Altoona, Pa., at a foreclosure sale. The plant has never been operated owing to lack of working capital. The new owners are said to be arranging for the organization of a company to remodel the works for another line of production. F. B. Hess, Uniontown, Pa., and Worth Kilpatrick, Connellsville, Pa., are interested in the project.

Fire, March 5, destroyed the machine shop at the Viaduct

plant of the Bethlehem Steel Co., Coatesville, Pa., with loss estimated at \$25,000 including equipment. It is planned to rebuild.

Manual training equipment will be installed in the two-story high school to be erected at Northampton and Twelfth Streets, Easton, Pa., estimated to cost \$1,000,000, for which bids are being received on a general contract until March 24. William M. Michler, Drake Building, is architect.

The State Highway Department, Harrisburg, Pa., will commence the construction of a new repair, service and storage plant for machinery used for road construction and maintenance, to cost \$75,000 with equipment.

The Stasco Milling Co., York, Pa., has construction nearing completion on a new slate grinding mill on Slate Ridge, near York, estimated to cost \$250,000 with machinery.

A. Foster, Jr., Chester Pike and Quarry Street, Darby, Pa., will soon take bids for a two-story automobile service and repair building, 80 x 100 ft., to cost \$70,000 including equipment. E. Allen Wilson, 1208 Chestnut Street, Philadelphia, is architect.

The Candlemas Coal Co., Silver Brook, near Hazleton, Pa., has commenced the construction of a new anthracite coal breaker and will install equipment for a daily output of about 3000 tons. The machinery will be electrically-operated.

The Board of Education, Gilberton, Pa., is considering the installation of manual training equipment in the proposed high school, estimated to cost \$160,000, for which foundations will be laid at once.

The Bluemont Stone Co., Conowingo, Pa., has acquired property near Cardiff, Pa., and is said to be planning the installation of electric power and other equipment for slate production.

Ray Bonner and James F. Dougherty, Allentown, Pa., have leased the two-story building, 40 x 100 ft., now in course of erection at 421-23 Tilghman Street, for a service and repair works for the Franklin automobile. Mr. Dougherty will be in charge of the machine department.

Buffalo

BUFFALO, March 10.

PLANS are being completed by the Westinghouse Machine Co., Attica, N. Y., manufacturer of stokers, etc., for a one-story foundry addition, 60 x 100 ft., for which foundations will be laid in April. A. P. Arnold is in charge.

The Victor Box & Mill Co., Buffalo, has purchased land at Sumner, Brinkman and West Shore Avenues, and will commence the erection of a new mill to cost \$70,000 with equipment. The machinery will be electrically-operated.

W. J. Snyder and F. P. Conlon, Mount Morris, N. Y., are at the head of a project to establish a local plant for the manufacture of automobile equipment, occupying a portion of the former Swett farm property. The initial works will give employment to more than 200.

The J. B. Wise Co., Inc., Mill and Moulton Streets, Watertown, N. Y., manufacturer of brass plumbing specialties, pipe angles, etc., is perfecting plans for rebuilding the portion of its plant recently destroyed by fire, estimated to cost about \$45,000. L. H. Mitchell is general manager.

Leroy D. Becraft, 168 East Market Street, Corning, N. Y., is having plans drawn for a three-story automobile service and repair building, 45 x 75 ft., to cost \$75,000 with equipment. W. H. Welch, 145 Decatur Street, is architect.

The Iroquois Door Co., Exchange and Larkin Streets, Buffalo, has been granted permission by the Supreme Court, following refusal by the city, to build additions to its plant, consisting of a four-story assembling works, two-story mill and other structures, to cost \$95,000 with equipment. A. J. Phinney is vice-president.

The Board of Education, Allegany, N. Y., is considering the installation of manual training equipment in the proposed high and grade school, for which an appropriation of \$170,000 has been voted. A. W. E. Schoenberg, National Bank Building, Olean, N. Y., is architect. Dr. J. S. Hicks is president of the board.

The Lapp Insulator Co., Inc., Le Roy, will double the capacity of its plant by an addition, 120 x 500 ft., to cost about \$225,000.

The Fox Textile Corporation, Erie, Pa., is making plans for the construction of a factory at Jamestown, Pa., and will be in the market for considerable textile machinery, etc., in addition to transmission and conveying equipment.

The Angle Steel Tool Co., Otsego, N. Y., plans the erection of a one-story addition, 63 x 82 ft.

The Standard Oil Co. of New York, 26 Broadway, New York, will commence the construction of storage and distributing plants at Oswego and Sacketts Harbor, N. Y., to

The Crane Market

There has been no particular increase in the volume of new inquiries in the past week, but two pending lists of cranes were awarded, the Southern Railway, Washington, D. C., having purchased from the Pawling & Harnischfeger Co., and the Western Electric Co., for Kearny, N. J., from the Shaw Electric Crane Co. Among current inquiries is one from the Cincinnati, Indianapolis & Western Railroad Co., Indianapolis, Ind., for a 200-ton overhead crane or locomotive hoist. The United States Engineer's Office, Huntington, W. Va., is asking for prices on a 3-ton hand power crane. The Commonwealth Quarry Co., Morristown, N. J., is in the market for an electrically-operated, crawl-tread locomotive crane for its quarry at East Summit, N. J. The General Electric Co., Schenectady, N. Y., has revised its inquiry for a 30-ton, 15-ton and 10-ton electric traveling crane for Schenectady to one 50-ton overhead crane with 15-ton auxiliary. Current inquiries of this company now include two 100-ton and two 10-ton cranes for Pittsfield, and two 50-ton cranes, one for Schenectady and one for Erie, Pa. The Flockhart Foundry Co., Newark, N. J., which recently purchased a 5-ton crane from the Pawling & Harnischfeger Co., is reported to be contemplating the purchase of two 2-ton and one 3-ton electric traveling crane. Joseph Stolz & Son, Commerce Avenue, Highbridge Station, New York, is in the market for a 6-ton hand power guy derrick.

Among recent purchases are:

Southern Railway, Washington, D. C., for its Finley shops, one 150-ton, 77-ft. 5-in. span; two 15-ton, 75-ft. 1-in. span; two 15-ton, 56-ft. 6-in. span; two 15-ton, 23-ft. 11½-in. span; one 20-ton, 60-ft. span; one 20-ton, 58-ft. 2½-in. span, and two 20-ton, 38-ft. 7½-in. span, all three motor, overhead traveling cranes from the Pawling & Harnischfeger Co.

Western Electric Co., New York, for plant at Kearny, N. J., a 30-ton, 42-ft. 6½-in. span; 20-ton, 19-ft. 8-in. span; 25-ton, 46-ft. 2¼-in. span; two 5-ton, 46-ft. 2¼-in. spans; a 5-ton, 12-ft. 9¾-in. span hand power crane from the Shaw Electric Crane Co. and a ½-ton, 46-ft. 8-in. span, 1-motor crane reported to have been awarded to the Sprague Electric Works.

New Haven Trap Rock Co., New Haven, Conn., a 10-ton hand power crane from the Whiting Corporation.

Frog & Switch Mfg. Co., Carlisle, Pa., a 20-ton, 50-ft. span electric traveling crane from an Eastern crane builder.

J. G. White Engineering Co., 43 Exchange Place, New York, a special gantry crane to carry lights used in the artificial culture of plants at the Boyce-Thompson Institute, Yonkers, N. Y., from the Bedford Foundry & Machine Co.

Lehigh Structural Steel Co., Allentown, Pa., a 20-ton, 50-ft. boom used Brownhoist locomotive crane for Roanoke, Va., from Philip T. King, New York.

Worthington Pump & Machinery Corporation, Harrison, N. J., a 15-ton, 8-wheel locomotive crane for Harrison, N. J., from the American Hoist & Derrick Co.

Lynchburg Foundry Co., Lynchburg, Va., a 20-ton used Industrial locomotive crane from an unnamed dealer.

Stevens & Wood, Inc., engineers, a 22½-ton locomotive crane for the Ohio River Edison Co., Toronto, Ohio, from the Industrial Works.

Great Northern Equipment Co., Seattle, Wash., a 40-ton locomotive crane from the Industrial Works.

Hershey Machine & Foundry Co., Manheim, Pa., two 3-ton, 28-ft. span, single I beam cranes from the Shepard Electric Crane & Hoist Co.

Frazier & Co., 30 Church Street, New York, three 2-ton, cage control monorail hoists for export to Japan, from the Shepard Electric Crane & Hoist Co.

Carolina Steel & Iron Co., Greensboro, N. C., three 3-ton, single I beam hoists from the Shepard Electric Crane & Hoist Co.

Phoenix Utility Co., 71 Broadway, New York, two 20-ton electric hoists from the Whiting Corporation.

Buick Motor Co., Flint, Mich., a 15-ton, 57-ft. 10¼-in. span, 4-motor overhead crane from the Whiting Corporation.

Standard Sanitary & Mfg. Co., six 5-ton, 44-ft. span overhead cranes with 10-ton trolleys for Baltimore plant from the Pawling & Harnischfeger Co., and one 5-ton, 48-ft. span, floor controlled, overhead crane from the Chesapeake Iron Works.

Continental Heater Corporation, Dunkirk, N. Y., a 5-ton, 100-ft. span magnet crane from the Northern Engineering Works.

American Sheet & Tin Plate Co., Pittsburgh, a 15-ton electric jib crane from the Whiting Corporation.

Peerless Portland Cement Co., Detroit, four 80-ft. span bucket cranes, 3-cu. yd. capacity; one 40-ft. span bucket crane, 1-cu. yd. capacity, and a 5-ton, 20-ft. span, and a 10-ton, 43-ft. span hand power cranes from the Whiting Corporation.

American Smelting & Refining Co., New York, two 10-ton, 40-ft. span overhead traveling cranes from the Milwaukee Electric Crane & Mfg. Co.

handle tank steamer deliveries, estimated to cost \$1,750,000 including machinery.

The Hart & Crouse Co., Turner Street, Utica, N. Y., manufacturer of steam and hot water heaters, etc., has awarded contract to H. R. Beebe, Utica City National Bank Building, for a one-story foundry addition, 145 x 205 ft., to cost approximately \$180,000 with equipment.

The Sage Economy Radiator, Inc., Water Street, Watertown, N. Y., recently formed as an interest of the Sage Radiator Co., Syracuse, N. Y., is said to be in the market for sheet-metal working and kindred equipment for installation in its new plant in course of erection. H. W. Ackerman is treasurer.

Cole Brothers, Lockport, N. Y., are having plans drawn for a two-story automobile service and repair building, 55 x 125 ft., and propose to take bids in the near future. Nichols & Gardner, 46 North Pearl Street, Albany, N. Y., are architects.

Pittsburgh

PITTSBURGH, March 10.

THE event of the week in this market has been the placing of the tools and cranes for the new plant of the Standard Sanitary Mfg. Co. at Baltimore. The list, which embraced 23 machines, went largely to one company, the only tools not included in the order being two American radials and a Cincinnati open-side planer. It was a lump sum proposition and this ultimately reduced the number of bidders. Six cranes were awarded to the Pawling & Harnischfeger Co. and one to the Chesapeake Iron Works. The trade is figuring on a big volume of inquiries, but buyers seem to be in no hurry to close.

The Westinghouse Electric & Mfg. Co. is inquiring for

the cranes for its transformer plant at Sharon, Pa. The Carnegie Steel Co. is expected to close this week on two 15-ton, bar and chipping yard cranes for its Duquesne works and has secured bids on two 15-ton soaking pit cranes for its Homestead works. It is understood that the Youngstown Sheet & Tube Co. quietly placed the orders for mills and other equipment for its new sheet plant some time ago.

Bids will be received by the United States Engineer, Huntington, W. Va., until March 15, for one boiler feed pump, circular 73.

The Westinghouse Electric & Mfg. Co., East Pittsburgh, has plans for the erection of three new buildings at Sharon, Pa., primarily for transformer manufacture, to be one- and four-stories, 150 x 1000 ft., 90 x 650 ft., and 80 x 350 ft., to cost approximately \$1,000,000 with machinery. Bernard H. Prack, Keystone Building, Pittsburgh, is architect. The company has arranged for a stock issue of \$17,955,000, a portion of the proceeds to be used for expansion.

The Lincoln Coal Corporation, Glenwood Hotel, Kenova, W. Va., recently organized, is said to be planning for the installation of electric power and mining machinery on about 500 acres in the Big Sandy field, Wayne and Mingo counties, lately purchased. W. H. Shelby, Huntington, W. Va., is treasurer. J. R. Booth is superintendent.

The Kanawha Equipment Co., Charleston, W. Va., machinery dealer, has inquiries out for a 100-ton hydraulic wheel press.

The Wheeling Traction Co., Wheeling, W. Va., has awarded a general contract to the R. R. Kitchen Co., Wheeling, for its car barn and shops at Warwood, W. Va., to include a complete car-overhauling shop, machine repair shop, and woodworking plant. The company is a subsidiary of the West Penn Railways Co., Pittsburgh. J. L. Fritsch is chief engineer.

The Pittsburgh Screw & Bolt Co., Freble Avenue, Pittsburgh, will commence construction by day labor of a one-story addition, 100 x 250 ft., estimated to cost \$90,000 with equipment.

The Motor Car & Truck Co., Huntington, W. Va., will commence the erection of a three-story service and repair building, 105 x 200 ft., on Fourth Avenue, estimated to cost \$130,000 with equipment.

The Huntington Sash & Cabinet Co., Huntington, W. Va., recently organized, plans the erection of a new one-story plant at Westmoreland, W. Va., estimated to cost \$50,000 with woodworking and other machinery. B. L. Winters is general manager.

The Fordson Coal Co., Bluefield, W. Va., operated by the Ford Motor Co., Highland Park, Detroit, is planning the construction of from 4 to 6 steel tipples at its properties in the Tug River section, including one at Pond Creek and another at Twin Branch. The structures will cost in excess of \$500,000 with machinery.

H. O. Swoboda, Inc., Pittsburgh, has been retained by Hubbard & Co. of that city, manufacturer of shovels and electric materials, to prepare plans and specifications for the new substation which the Duquesne Light Co. will install for these works. The plant will be supplied with 11,000 volts, three-phase, a. c., and the distribution will be made with 440 volts, three-phase for power and 110/220 volts, single-phase for light. Contracts will be let as soon as the plans and specifications are completed.

The Staaf Auto Brake & Mfg. Co., 407 Fairywood Avenue, Pittsburgh, has been organized to manufacture a four-wheel brake attachment for automobiles. Manufacturing will be done by an outside concern. The company will maintain an assembling plant, either in Johnstown, Pa., or Pittsburgh, and in the near future will be in the market for such materials as steel stamping and malleable iron castings. W. I. Staaf is president.

Cincinnati

CINCINNATI, March 10.

IMPROVEMENT is noted in the machine tool industry and indications point to a considerably increased business in March over the two preceding months. Automotive buying continues at a fair rate, and railroad inquiries about to be closed will serve to keep interest alive. General business from industrial sources is picking up, and as a result there is more optimism than for some time past. There are no special inquiries of note, though the Santa Fe and the New York Central have added a number of tools to their lists.

Prominent among buyers the past week were the Big Four Railroad, with a number of radial drills; the Dayton Steel Castings Co., with eight Bullard Mult-aumatics, and the Lunkenheimer Co., Cincinnati, two large boring mills. The Union Gas & Electric Co. bought several small lathes and will require additional equipment. The Big Four Railroad still has a number of tools to place, and active purchasing against the Southern Railway list is expected to commence this week. Export orders for lathes and planers were booked from Brazil, France and the Philippine Islands last week by local manufacturers.

The J. & F. Schroth Packing Co., Cincinnati, is asking bids on an extension to its plant, in which considerable conveying equipment will be installed.

The Wabash Portland Cement Co., Detroit, has completed plans for the erection of a plant at Osborn, Ohio, to cost approximately \$2,000,000. Bids for construction are expected to be asked within the next two weeks.

The W. B. Oglesby Paper Co., Middletown, Ohio, has awarded contract for the erection of an addition to its plant costing \$100,000. Bleach-making machinery will be installed.

The Krein Chain Co., Wapakoneta, Ohio, is understood to have completed plans for the erection of a plant in Cleveland in which electric welded chain will be manufactured. Heavy chain will continue to be made in the Wapakoneta works.

The Ohmer Fare Register Co., Dayton, Ohio, has purchased the entire business of the American Taximeter Co., New York, and the manufacturing activities of the two companies will be concentrated in the Ohmer plant at Dayton.

The plant of the Hocking Glass Co., Lancaster, Ohio, was destroyed by fire March 7, the loss being estimated at \$500,000. It will be rebuilt as soon as possible. The company had completed plans for opening branch works at Bremen, Ohio, and plans for this unit were destroyed in the fire. It employed 650 men. J. I. Collins is president.

Bids have been taken by the Ford Motor Co., Detroit, for its assembling plant at Louisville, estimated to cost \$500,000 with equipment. Albert Kahn, 1000 Marquette Building, Detroit, is architect.

The Shelton Brothers Foundry Co., Paducah, Ky., has plans for a new one-story foundry, 60 x 95 ft., for the manufacture of iron castings, to cost about \$45,000.

The Standard Sanitary Mfg. Co., Bessemer Building, Pittsburgh, has awarded a general contract to L. W. Hancock, Louisville Trust Building, Louisville, for a three- and four-story and basement addition to its brass works, Sixth and Shipp Streets, 165 x 450 ft., to cost about \$1,000,000 with equipment. A large portion of the structure will be used as a foundry. Joseph & Joseph, Francis Building, Louisville, are architects.

The Turnbull Cone & Machinery Co., Chattanooga, Tenn., has awarded a general contract to T. S. Mondy & Co., Chattanooga, for a new four-story plant on Fort Street, for the manufacture of ice cream cone-making machinery and parts. It will cost about \$50,000 with equipment.

Permit has been issued to the Bright school, Fort Wood Street, Chattanooga, Tenn., for a two-story brick industrial building, estimated to cost \$50,000, for which mechanical equipment will be purchased later.

Manual training and vocational equipment will be installed in the high school to be erected at Clay, Ky., for which a bond issue has been voted. The Board of Education is in charge.

The City Council, Owensboro, Ky., is contemplating the purchase of a compound condensing ejector for the municipal light and power plant, to cost about \$12,000. Superintendent Watson of the city light plant is in charge.

Generators, motors and other equipment will be required for the new light and power plant to be erected by the city of Henderson, Ky., estimated to cost \$100,000. Leslie Hite, superintendent city light plant, is in charge.

Drills, presses, reboring mills, lathes and other equipment, motor-driven, will be installed in the garage and service station to be established by T. J. Lea, Owensboro, Ky.

The Simplex Foundry Co., 333 Dennison Avenue, Columbus, Ohio, specializing in bronze, copper and aluminum castings, has completed an addition to its foundry of 6000 sq. ft., thereby doubling its capacity.

New England

BOSTON, March 11.

WITH very few exceptions dealers in both new and used machine tools have booked practically no business the past week. The two most conspicuous exceptions to the general apathy is the sale of a 100-ton Shaw crane to Stone & Webster, Boston, for a southern California power house, and approximately \$3,000 punch and shear equipment to the Boston & Maine Railroad. Inquiries for small amounts of metal-working equipment continue, however, serving to keep interest among dealers at a high pitch. The new prospects added to old ones, which for one reason or another defer closing, in the aggregate amount to sufficient business, which, if booked, will place the machinery dealers in a prosperous position. The Maine Central Railroad gives no indication of closing on its list of tools, and an East Boston manufacturer who some time ago issued a large list is buying only when there are offerings of used machinery in excellent condition and at low prices.

The C. K. Seymour Corporation, Waters River, Danvers, Mass., has sold its plant to the American Rim Corporation, capitalized for \$800,000 and recently incorporated to manufacture automobiles and accessories. Clinton K. Seymour, Winchester, Mass.; Henry W. Randall, Beach Bluff; Samuel Scott and Charles H. Hanson, Lowell, are behind the new company.

Bids closed March 12 for a three-story, 50 x 135 ft., wire mill, to be erected by the Gilbert & Bennett Co., Georgetown, Conn. Greenwood & Noerr, 847 Main Street, Hartford, Conn., are the architects.

The Casper Ranger Construction Co., 22 Bond Street, Holyoke, Mass., has been awarded contract to erect a 60 x 140 ft. coal pocket for the Holyoke Gas & Electric Co., for which conveying machinery is required. McClintic & Craig, 33 Lyman Street, Springfield, Mass., are the engineers.

Plans are in progress for a proposed junior high school to cost \$135,000, to be erected by the town of Falmouth, Mass., which will contain manual training shops. J. Robertson Ward, 8 Cornhill, Boston, is the architect.

Overhead conveying machinery and other equipment will be required for a one-story, 50 x 70 ft. packing house to be erected by Hyman Levine, 97 South Street, New Bedford,

Mass., plans for which are in progress. La Brode & Bullard, Olympia Building, New Bedford, are the architects.

The Kobert Machine Co., Worcester, Mass., manufacturer of electric-riveting machines, has taken out a State charter with capital of \$500,000 and headquarters at Gardner, Mass., where property has been acquired for a new factory, erection to commence in the spring. It is purposed to remove the present works to the new location and install considerable additional equipment. Frank P. Kobert is president, and James A. Redemann, 60 White Street, Springfield, Mass., treasurer.

The Central Maine Power Co., Augusta, Me., has preliminary plans for a new electric generating plant at Oakland, Me. F. H. Mason, Waterville, Me., is engineer.

The Corning Glass Works, Inc., Corning, N. Y., has acquired the former Rhode Island glass division plant of the General Electric Co. at Central Falls for a branch works and will provide facilities for more than 100 workers.

The Crocker, McElwain Co., Cabot Street, Holyoke, Mass., manufacturer of paper products, has awarded a general contract to the Daniel O'Connell Co., 480 Hampden Street, for a two-story addition, to cost \$50,000.

The Connecticut Co., 129 Church Street, New Haven, Conn., operating a motor bus line, has plans for a one-story service and repair shop, 43 x 175 ft., at Waterbury, Conn. H. R. Stamm, New Haven, is architect.

The Dalton Electric Heating Co., Salem, Mass., recently organized, will operate a plant at 278 Bridge Street for the manufacture of domestic electric heating appliances. A department will also be given over to the production of ovens, electric furnaces, etc. William H. Dalton is president, and E. H. Chapman, treasurer and factory manager.

H. P. Hood & Sons, 155 Massachusetts Avenue, Cambridge, Mass., dairy products, have filed plans for a steam power house, to cost \$35,000, on which work will proceed at once.

Plans are being prepared for manual training departments at the Maloney School, Waterbury, Conn., for which equipment will be required.

Thomas M. Freney, 51 Leavenworth Street, Waterbury, Conn., is preparing plans for additions to the Bunker Hill School, Waterbury, to contain rooms for manual training.

Chicago

CHICAGO, March 10.

FORTY-THREE additional inquiries, issued by the Santa Fe, bring the total number of items on that road's pending list up to 168. The Missouri Pacific is figuring on tools at St. Louis with the probability that it will buy in monthly installments instead of placing all of its equipment at one time. The Cincinnati, Indianapolis & Western, Indianapolis, is inquiring for a No. 690 Chambersburg, or equivalent, motor-driven hydraulic wheel press. Prospects are good for considerable business from the steel mills in this district, although no orders have as yet been reported. Orders from other industrial buyers are developing in encouraging volume, although confined largely to single machines.

The Western Electric Co., Hawthorne, Ill., has closed for seven engine lathes, involving between \$15,000 and \$20,000. The Viking Engineering Co., Hammond, Ind., has placed orders for a 30-in. engine lathe and a 24-in. shaper. The Elgin National Watch Co., Elgin, Ill., has closed for a 14-in. x 6-ft. engine lathe. The Winslow Boiler & Engineering Co., Galesburg, Ill., has purchased a hand-screw machine and a disk grinder. The Chicago Board of Education is inquiring for the following woodworking equipment for the Marquette branch of the Crane Technical High School: Two motor-driven Wallace, or equivalent, 4-in. bench planers, one motor-driven Syracuse, or equivalent, 20-in. band saw, and one motor-driven No. 585 Oliver, or equivalent, oil stone tool grinder. The city of Chicago is in the market for a punch and shear.

Additions to Santa Fe List

One No. 5 Cincinnati, or equivalent, motor-driven high-power milling machine.

One motor-driven 36 x 36-in. x 12-ft. Gray, or equivalent, planer.

One 2½ x 26-in. motor-driven Hartness, or equivalent, turret lathe.

Two 14-in. x 6-ft. Lodge & Shipley, or equivalent, motor-driven portable lathes.

One Cincinnati Acme, or equivalent, motor-driven universal turret lathe.

One 800-lb. single frame steam hammer.

One 42-in. Bullard, or equivalent, motor-driven vertical turret lathe.

One No. 2½ Landis, or equivalent, motor-driven bolt cutter.

One 6-ft. motor-driven radial drill.

Two motor-driven double wet emery grinders with 24 x 3-in. wheels.

Four motor-driven double dry emery grinders with 24 x 3-in. wheels.

One 4-spindle belt-driven radial drill.

Two 100-in. motor-driven boring mills.

Two motor-driven 84 x 24 x ¾-in. locomotive guide grinders.

One 32-in. x 12-ft. single pulley drive heavy duty engine lathe.

One 4000-lb. double frame steam hammer.

One 20-in. x 12-ft. motor-driven heavy duty geared head engine lathe.

One No. 3 Cincinnati, or equivalent, universal high-power, motor-driven milling machine.

Two No. 417 Baker, or equivalent, motor-driven heavy duty drills.

One motor-driven 72 x 72-in. x 25-ft. planer.

Two 36-in. motor-driven draw-stroke shapers.

One motor-driven 44-in. car wheel grinder.

One 90-in. Putnam, or equivalent, motor-driven wheel lathe.

One belt-driven Oliver, or equivalent, die making machine.

One belt-driven 2½-in. Jones & Lamson turret lathe.

Two 20-in. motor-driven drill presses.

One 24-in. motor-driven drill press.

Four 16-in. x 6-ft. motor-driven portable lathes.

One 26-in. x 12-ft. motor-driven lathe.

One 24-in. motor-driven shaper.

The Whiting Corporation, Harvey, Ill., has taken the following orders for foundry equipment: One No. 1 cupola for the Board of Education, Toledo, Ohio; one No. 7 cupola for the Lindgren Foundry, Batavia, Ill.; one No. 2 cupola for the Board of Education, Chicago; one No. 3½ cupola for the Seaboard Air Line Railroad, Portsmouth, Va.

The Builders Slide Board Co., manufacturer of built-in furniture for homes, Minneapolis, Minn., has purchased a site at 215 Seventh Street, North East, and will start at once the erection of a three-story factory to cost \$100,000.

The Walworth Mfg. Co., with a plant at Kewanee, Ill., contemplates the erection of a new steel foundry at that city for the manufacture of steel valves and fittings. The construction of the plant is dependent upon securing proper electrical current in that city.

W. D. Sager, stove manufacturer, 330 North Western Avenue, Chicago, has purchased a site, 116 x 127 ft., at 837 Larrabee Street, and will erect a four-story factory.

The American Steel Foundries, Chicago, has completed additions at its Indiana Harbor, Ind., plant at a cost of \$100,000. Improvements include a cleaning room, pattern shop, extension to dry sand foundry, and a wash and locker room.

The Tri-City Malleable Castings Co., East Moline, Ill., has increased its capital stock from \$300,000 to \$350,000 to take care of expansion in business.

The Mount Vernon Car Mfg. Co., Mount Vernon, Ill., has placed contract for a wood mill, 204 x 350 ft., and a power house, 40 x 98 ft., to cost \$200,000. The company has just completed a blacksmith shop, 100 x 350 ft., and a repair shed, 100 x 500 ft.

The Illinois Power & Light Corporation contemplates the construction of a water-gas plant at LaSalle, Ill., to cost \$50,000.

The Calumet Power Co., a new corporation, of which Samuel Insull, Chicago, is president, and Charles W. Chase, Gary, Ind., and Morse Dell Plain, Hammond, Ind., vice-presidents, will build a "super-power" electric transmission line from the Calumet generating station of the Commonwealth Edison Co., South Chicago, through Hammond and Gary to Aetna, Ind., where a 55,000-hp. substation will be constructed.

The Alton File Co., Alton, Ill., is inquiring for second-hand machinery for the manufacture of files and rasps.

The General Iron Works Co., Denver, Colo., will construct a foundry and machine shop, to cost \$1,000,000, in Denver, near Englewood. Two years ago the General Iron Works Co. was formed by an agreement between the Stearns-Roger Co., the Colorado Iron Works, the Denver Engineering Works, the Vulcan Iron Works and the Queen City Foundry. The new plant will take the place of the separate works now in operation. Each of the companies, however, will maintain its own identity so far as its selling and its administrative forces are concerned. The new works will be a cooperative shop and will be for the mutual benefit of the respective owners.

The Linwood Cement Co., Davenport, Iowa, plans the immediate erection of a new mill, with power house, estimated to cost \$115,000. Frank Neufeld and A. C. Klindt head the company.

The Nebraska Power Co., Omaha, Neb., has arranged for a bond issue of \$980,000, a portion of the proceeds to be used for extensions and the installation of additional equipment.

The Northern Pacific Railroad Co., St. Paul, Minn., has

preliminary plans for enlargements in its repair shops and boiler plant at Livingston, Mont., estimated to cost \$250,000 including equipment.

The Common Council, Hastings, Neb., is completing plans for a municipal electric light and power plant and waterworks station and will soon call for bids. It is estimated to cost \$40,000.

The Sterling Level & Tool Co., Sterling, Ill., is having plans drawn for a one-story addition, 100 x 130 ft., to cost about \$35,000, for which bids will soon be asked on a general contract. William Harley, Jr., 32 North State Street, Chicago, is architect.

The Common Council, Kearney, Neb., is planning the installation of an oil-driven semi-Diesel engine and auxiliary equipment in connection with extensions and improvements in the municipal waterworks, estimated to cost \$130,000. The Burns & McDonnell Co., Kansas City, Mo., is engineer.

The Chicago, Burlington & Quincy Railroad Co., 547 West Jackson Boulevard, Chicago, is reported to be planning the construction of a new car building and repair plant at Galesburg, Ill., estimated to cost \$225,000 including equipment. A. W. Newton is chief engineer.

The Benjamin Electric Co., 847 West Jackson Boulevard, Chicago, manufacturer of electrical equipment, has plans for extensions in its four-story and basement plant at 213 South Green Street, estimated to cost \$42,000. J. E. Youngberg, 431 South Dearborn Street, is architect.

Electrical pumping and other equipment will be purchased for the addition to the city waterworks, Jonesboro, Ill., estimated to cost \$42,000. The W. A. Fuller Co., 1917 Railway Exchange Building, St. Louis, is engineer in charge.

The A. L. Randall Co., 180 North Wabash Street, Chicago, is in the market for some new equipment, including gas or electric paint spraying machine.

Electrical pumping and other mechanical equipment will be installed in the addition to be built to the city pumping station at Blandinsville, Ill., estimated to cost \$12,000, for which the City Council is in charge.

Fire, March 1, destroyed a portion of the mines and equipment of the Haynes Coal Mining Co., Haynes, N. Dak., with a loss of over \$100,000.

E. J. Morgan, Sycamore, Ill., is in the market for two 1000-hp., one 500-hp., one 350-hp. water tube boilers; also one 300-hp. uniflow direct connected a.c. generator.

The Hoar Brothers Co., Oskaloosa, Iowa, are in the market for a 15- to 18-in. engine lathe, complete with chuck, countershaft, hollow spindle, compound rest and tail stock.

Cleveland

CLEVELAND, March 10.

THE machine tool market is better in spots and some manufacturers look for an increase in sales during March as compared with February. Makers of lathes and drilling machinery report an increase in orders and inquiries the past week. Orders are well scattered, but few are for more than one or two machines. The Gravity Carburetor Co., Cleveland, placed orders for a number of tools aggregating approximately \$40,000, which included two special drilling machines taken by a local manufacturer. Some additional purchases of production machinery were made by the Studebaker Corporation for its South Bend plant. Few orders are coming at present from the automobile industry in the Detroit territory.

Business with local dealers is only moderately active and sales are not as numerous as a few weeks ago. While there is a fair volume of inquiry, buyers are showing a hesitancy about placing orders and are waiting for further developments in the trend of business before making commitments.

Information has reached the local machinery trade that a large amount of machinery was placed with American manufacturers the past few days by Blum-Latil, a large automobile manufacturing company in Paris, France. It included milling, grinding and drilling machines, all of which went to American manufacturers, and 30 turret lathes which were purchased in England.

Locomotive crane builders report an increase in inquiries, particularly from the railroads, several of which are from Canadian railroads.

The Cleveland Electric Illuminating Co., Cleveland, has acquired a site at Avon Beach, where it will erect a large generating station. Preliminary plans are now being prepared, but it may be several months before definite plans are completed and bids are asked for.

The Mills Co., 5320 St. Clair Avenue, Cleveland, manufacturer of sheet metal factory equipment, will erect a two-story addition, 42 x 64 ft.

The Thomas Cusack Co., Cleveland, manufacturer of outdoor advertising signs, is having plans prepared for a \$100,000 factory on Sumner Avenue. It will be a one and two-story brick and mill-type building, 110 x 140 ft. Zimmerman, Saxe & Zimmerman, 64 East Van Buren Street, Chicago, are the architects.

The city of Akron, Ohio, is having preliminary plans prepared for additions and alterations to its sewage disposal works involving an estimated expenditure of \$2,000,000. Metcalf & Eddy, 14 Beacon Street, Boston, are the consulting engineers.

The Columbus Auto Parts Co., 215 East Russell Street, Columbus, Ohio, will shortly begin the erection of a one-story building, 50 x 100 ft.

The Champion Hardware Co., Geneva, Ohio, plans shortly to erect a new plant. In a previous item relating to this company's building project its location was incorrectly given as Ashtabula, Ohio.

The Acklin Stamping Co., 1600 Dorr Street, Toledo, Ohio, manufacturer of stamped metal products, has awarded a general contract without competition to the A. Bentley & Sons Co., 201 Belmont Avenue, for a one-story plant, 150 x 550 ft., estimated to cost \$250,000 including equipment. G. M. Acklin is president.

James B. McCauly, Orchard Grove Avenue, Lakewood, Ohio, is in the market for considerable machinery and equipment for installation in a factory at Richmond, Ind., for the manufacture of fireproof doors. A draw bench is wanted at once.

St. Louis

ST. LOUIS, March 10.

CONTRACT has been let by the Southern Wheel Co., Railway Exchange Building, St. Louis, to the Virginia Bridge & Iron Works, Richmond, Va., for its one-story foundry at Portsmouth, Va., for the manufacture of railroad car wheels and kindred products, 90 x 150 ft., to cost \$135,000 with equipment.

P. C. Allen, Nashville, Ark., is perfecting plans for the organization of a company to construct and operate a cement mill in this vicinity, estimated to cost \$500,000. It will include a power plant. The new organization will be capitalized at \$1,000,000.

The Western Iron & Foundry Co., Wichita, Kan., has tentative plans for a new steel fabricating plant, estimated to cost \$50,000.

The Common Council, Newkirk, Okla., has called a special election on March 11 to vote bonds for \$100,000 for extensions in the municipal waterworks, including the installation of electric-operated centrifugal pumping machinery. H. E. Musson, Grain Exchange Building, Oklahoma City, Okla., is engineer.

The Galena Machine & Electric Co., Galena, Kan., has leased a one-story building, 50 x 90 ft., to be erected at 209 Main Street, by the Robeson Lumber Co. F. W. Speck is general manager.

The St. Joseph Water Co., St. Joseph, Mo., is considering plans for the installation of equipment at its plant, including two 350-hp. high pressure boilers with auxiliary apparatus to cost \$30,000; pumping machinery, \$85,000, and filter equipment \$100,000 with auxiliary apparatus. W. K. Seitz is city engineer; C. H. Taylor is president.

The Haynes-Langenberg Mfg. Co., 4525 North Euclid Avenue, St. Louis, manufacturer of gas furnaces and burners, will commence construction by day labor of its proposed one-story plant, 110 x 160 ft., to cost \$50,000 with equipment. J. C. Martin, Syndicate Trust Building, is engineer.

The Common Council, Atlee, Okla., is considering the installation of a new engine and other equipment at the municipal electric power station.

The Collier-Adams Mfg. Co., Fourth and Mitchell Streets, St. Joseph, Mo., manufacturer of sash, doors, etc., will commence the erection of a new three-story and basement plant, 65 x 135 ft., with one-story power house, 35 x 37 ft., to cost \$80,000. E. R. Meier, Lincoln Building, is architect.

Manual training equipment will be installed in the proposed two-story and basement high school to be erected at Bristow, Okla., estimated to cost \$140,000, on which work will soon commence. Lee Curran, Groom Building, is architect.

The Common Council, Enid, Okla., will soon take bids for a 150-hp. boiler and auxiliary equipment for installation at the municipal waterworks.

Indiana

INDIANAPOLIS, March 10.

SUPERSTRUCTURE work will soon commence on the new plant of the Baldwin Locomotive Works, Philadelphia, at East Chicago, Ind., to cost \$400,000 with equipment. It is said that a repair department will be installed with facilities to handle 150 locomotives. The plant will be operated in conjunction with the Eddystone Works of the company, near Philadelphia.

The Highway Iron Products Co., Ligonier, Ind., has inquiries out for 25 dump bodies for motor trucks and is desirous of getting in contact with manufacturers.

The Imperial Desk Co., Florida and Devon Streets, Evansville, Ind., has awarded a general contract to the M. J. Hoffman Construction Co., Furniture Building, for a new three-story building, 75 x 134 ft., to cost \$50,000. H. Gilbert Karges, Furniture Building, is architect.

The Pennsylvania Railroad Co., Philadelphia, has preliminary plans for rebuilding the portion of its shops and engine house at Valparaiso, Ind., recently destroyed by fire with loss estimated at \$45,000, including equipment. The reconstruction will cost approximately a like amount.

The City Council, Bloomington, Ind., is considering the installation of electric-operated pumping machinery at the proposed municipal water station at Griffy Creek, estimated to cost \$125,000.

Plans are being perfected for a resumption of operations at the Indiana Oil Refinery, Columbus, Ind., which has been closed for a number of months. The installation of equipment is being considered. John Scheidt is president.

The Madison Light & Power Co., Madison, Ind., has been acquired by the Louisville Gas & Electric Co., Louisville. The new owner plans extensions and the installation of additional equipment.

The Northern Indiana Gas & Electric Co., Hammond, Ind., will issue bonds for \$1,087,500, a portion of the proceeds to be used for extensions and the installation of additional equipment.

The Universal Endless Belt Co., Inc., North Vernon, Ind., recently incorporated with capital stock of \$25,000, has taken over a business established four years ago and will manufacture belting for both flat and V-shaped pulleys. Though no equipment is needed immediately, the company plans to build a factory in the near future and at that time will require equipment. John H. Gilmer heads the company.

The LaPorte Foundry & Furnace Co. plant, LaPorte, Ind., which was recently seriously damaged by fire, is being rebuilt.

Milwaukee

MILWAUKEE, March 10.

WHILE the activities of local tool builders are showing a slight but steady increase, it is the improvement noted by local dealers that commands the most attention at this time. The turnover of floor stocks is coming to a much more satisfactory point than for at least five months. Used tools are in relatively good request and the supply is more satisfactory. The Wisconsin Valley Electric Co., Wausau, Wis., is inquiring for a 40-ton electric crane for a new hydroelectric generating plant. The Parker Pen Co., Janesville, Wis., will soon issue a sizable list for a factory addition, and numerous industrial concerns are inquiring for one or two tools.

The Iron Products Corporation, LaCrosse, Wis., manufacturing drive and twist anchors for guy wires, has purchased the business of the Crouse-Hinds Co., Syracuse, N. Y., which makes conduit, anchors and electric transmission line fittings. The equipment will be moved to LaCrosse at once, and some new equipment, including two forging hammers, will be purchased. The LaCrosse company is enlarging its output of well-drills for oil and water supply work. C. R. Pieper is president and general manager.

The Corona Chemical Division, Pittsburgh Plate Glass Co., Milwaukee, will build a \$100,000 laboratory and manufacturing building, 100 x 140 ft., five stories and basement, adjacent to the new buildings erected by the same interest for its Patton-Pitcairn paint and varnish production division, 205-245 Lake Street, this city. The Corona division manufactures arsenate of lead and dry colors. Kirchhoff & Rogse, architects, 211 Grand Avenue, local, have completed plans and are now taking figures on the construction work. Ludington Patton is vice-president and general manager.

The Acme Plumbing & Heating Supply Co., 373 Fourth Street, Milwaukee, has placed contracts for the erection of

a manufacturing and warehousing addition costing about \$45,000 equipped. It manufactures galvanized heater tanks and other plumbing specialties.

The Mitchell Motor Car Co. of Racine, Wis., successor to the defunct Mitchell Motors Co., Inc., has completed the removal of equipment and stock from the Mitchell works to leased quarters at Lake Avenue and Fourth Street and for the present will devote itself to manufacturing and furnishing repair and replacement parts, also assembling a limited number of passenger cars from materials now in hand. Plans for quantity production later are still under consideration. W. L. Clunie is service manager.

The Milwaukee Service Parts Co., Milwaukee, has been incorporated by John D. Waite, 384 First Avenue, Wauwatosa, suburb of Milwaukee, and N. J. King and D. J. O'Brien, to manufacture piston pins, screw products and general automobile materials and parts. The capital stock consists of \$25,000 preferred and 500 common shares without par value. Arrangements are being made for equipping a machine shop and warehouse in leased quarters.

The Wisconsin Valley Electric Co., Wausau, Wis., has let the general contract to L. A. DeGuere, Wisconsin Rapids, Wis., for designing and constructing a hydroelectric generating plant, 32 x 126 and 34 x 32 ft., on the Wisconsin River near Merrill, Wis. The water wheel equipment has been placed with the S. Morgan Smith Co., York, Pa., and generators and other equipment to the General Electric Co., Schenectady, N. Y. Figures will be taken soon on a 40-ton electric crane and some minor items. The project involves about \$100,000.

The Linton Oil Co., Chicago, has acquired a site in the township of Wauwatosa for the construction of a refinery to produce motor fuels. The Best Test Oil Co. will be incorporated in Wisconsin as the production corporation. The principals are E. O. Linton, engineer and fuel expert Inland Steel Co., Indiana Harbor; E. A. Burrows, consulting engineer, Chicago, and Charles S. Burdick, R. J. Beatty, formerly of the Inland Steel Co., is president; James C. Wall, vice-president, and Mr. Burrows, secretary-treasurer. An experimental plant is now under construction here.

The Parker Pen Co., Janesville, Wis., manufacturer of fountain pens and metal pencils, contemplates an investment of at least \$150,000 in extensions. The proposed addition will be 120 x 130 ft., four stories and basement. A considerable list of equipment, including lathes, automatic screw machines, millers and presses will be required. George S. Parker is president.

The Prime Mfg. Co., 653 Clinton Street, Milwaukee, manufacturer of brass and bronze railroad and automotive castings and materials, is taking bids through Frank D. Chase, Inc., 645 North Michigan Avenue, Chicago, for the construction of a brick and steel brass foundry, 80 x 160 ft., one to three stories. Equipment specifications have been completed and figures are now being taken. H. G. Wild is secretary-treasurer.

The Thomas C. Olson Co., Madison, Wis., has been incorporated with a capital stock of \$35,000 to manufacture machine, mechanical supplies, castings, repairs, etc. Headquarters being established at 609 East Washington Avenue. Thomas C. Olson is president; Clarence E. Lee, vice-president, and Edward K. Olson, secretary-treasurer.

Detroit

DETROIT, March 10.

WORK will commence early in April by the Schleider Mfg. Co., Detroit, manufacturer of machine engine valves, etc., on its new plant at Milford, Mich., to cost about \$50,000. The present factory will be removed and additional equipment installed.

Bids are being asked for the erection of a two-story addition, 60 x 155 ft., at the plant of the Wolverine Tube Co., 1411 Central Avenue, Detroit, estimated to cost \$60,000. Esselstyn & Carey, 2539 Woodward Avenue, are architects and engineers.

The Common Council, Berkley, Mich., plans the installation of an electric-operated pumping plant in connection with the proposed municipal waterworks, estimated to cost \$250,000. R. A. Murdock, Free Press Building, Detroit, is engineer.

The Birmingham-Prosser Co., Kalamazoo, Mich., paper products, has preliminary plans for an addition on site recently acquired, totaling about 85,000 sq. ft. of floor area, estimated to cost close to \$80,000.

The Michigan Sugar Co., 312 Union Telegraph Building, Detroit, with refinery at Saginaw, Mich., is closing negotiations for the purchase of the sugar mills at Owosso and Lansing, Mich., heretofore controlled by interests of the Pittsburgh Plate Glass Co., Pittsburgh. The purchasing company plans to remodel the mills, providing additional equip-

ment in some departments. A fund of \$1,000,000 will be arranged to carry out the project.

The Olds Motor Car Co., 7 Sproat Street, Detroit, has leased a four-story building, 90 x 145 ft., to be erected at Cass Avenue and York Street, at a cost of about \$100,000, for a new service and repair works.

The Rich Tool Co., Railway Exchange Building, Chicago, has removed its plant to Detroit, where additional facilities will be provided for considerable increase in output. Executive offices will be maintained at Chicago.

The Oakland Motor Car Co., Pontiac, Mich., has tentative plans for taking over the former automobile equipment plant of the Saginaw Products Co., Saginaw, Mich., closed for a number of months. It will be equipped as an auxiliary plant to manufacture parts and engine equipment. Assembling will be continued at the Pontiac works.

The Wood Hydraulic Hoist & Body Co., 4196 Bellevue Avenue, Detroit, has preliminary plans for a one-story building on North Beacon Street, Boston. It is proposed to build other structures later for an Eastern factory branch.

Gulf States

BIRMINGHAM, March 10.

ATRACT of 4 acres has been purchased by the Houston Lighting & Power Co., Houston, Tex., a portion of the site to be used for a new service and machine works, including motor repair department for company trucks and cars.

The Common Council, Brady, Tex., is planning for a bond issue of \$100,000 for extensions and improvements in the municipal waterworks, to include the installation of electric-operated pumping machinery.

E. C. Palmer & Co., Dallas, Tex., paper products, will erect a four-story and basement plant on Lacy Street, 50 x 143 ft., to replace its works recently destroyed by fire, estimated to cost \$65,000. L. R. Whitson, Dallas, is architect. Headquarters of the company are at New Orleans.

The Monroe Mill Work & Box Co., Monroe, La., recently organized, is planning the construction of a new factory at South Monroe, for the manufacture of boxes, sash, doors, etc. C. C. Bell and Travis Oliver, both of Monroe, head the company.

The Houston Compress Co., Houston, Tex., is planning the immediate construction of a one-story cotton-compressing plant on the Ship Channel, 50 x 1500 ft., estimated to cost \$200,000 with machinery.

The Alabama Power Co., Birmingham, is disposing of a block of preferred stock, a portion of the proceeds to be used in connection with hydroelectric generating projects on which work has been commenced, and for other expansion. Thomas W. Martin is president.

John W. Jackson, Palmetto, Fla., has inquiries out for an air compressor and accessory equipment.

S. L. Jeffers, 1 Bushnell Place, San Antonio, Tex., is perfecting plans for a four-story automobile service and repair building, 65 x 215 ft., to cost approximately \$150,000 including equipment. H. T. Phelps, Hicks Building, is architect.

Fire, March 5, destroyed a portion of the machine and forge shops and power house at the locomotive repair works of the Missouri Pacific Railroad Co., Monroe, La., with loss reported at \$100,000 including equipment. It is planned to rebuild. Headquarters of the company are at St. Louis.

The Common Council, Lafayette, La., is arranging a bond issue of \$200,000, the proceeds to be used for extensions and improvements in the municipal electric light and water plant, including the installation of additional equipment.

The Standard Oil Co., Clearwater, Fla., has tentative plans for rebuilding the portion of its local storage and distributing plant destroyed by fire March 1, with loss estimated at \$50,000 including equipment.

The Seminole Bed Spring Mfg. Co., Miami, Fla., is planning for extensions in its plant at 2027 North Miami Avenue, including the remodeling of a portion of the present works and the installation of additional equipment.

The Eastern Texas Electric Co., Beaumont, Tex., has been formed under Delaware laws with capital of \$2,500,000 to take over the company of the same name operating at Beaumont, Port Arthur and vicinity. Plans are under way for the acquisition of additional properties. Extensions will be made in plants and system.

The Texas Midland Railroad Co., Terrell, Tex., has preliminary plans for the electrification of its line from Ennis to Paris, Tex., to cost \$1,500,000 including automatic sub-

stations, power house and line equipment. L. G. Wells is general manager.

The Southwestern Lime Co., 1216 W. T. Waggoner Building, Fort Worth, Tex., recently organized, plans the purchase of an air compressor and other equipment for installation at its plant at Benbrook, Tex. E. T. Springer is secretary-treasurer and general manager.

The G. R. Mueller Co., Brown-Marx Building, Birmingham, manufacturers' agent, has inquiries out for one vertical punch, for handling metal 1 in. thick, or larger; one set of bending rolls, to handle plates 3/4 in. to 1 1/2 in. thick, 6 to 8 ft. long, and for angle bending rolls, to handle iron angles, 6 x 6 in., and smaller.

The Unger-Buick Co., Miami, Fla., local representative for the Buick automobile, will commence the erection of a new two-story service and repair building, 85 x 215 ft., to cost approximately \$115,000, including equipment, for which a general building contract has been let to George Jahn, Miami. George L. Pfeiffer and G. J. O'Reilly, Miami, are architects.

The Texas Sugar Refining Co., Texas City, Tex., has work in progress on twelve buildings for its proposed refinery, and plans for the early installation of machinery for an initial daily output of 1,000,000 lb. of refined sugar. Later this will be increased to 1,500,000 lb. daily. The plant will include a power house and will cost in excess of \$750,000 with equipment.

Plans are being arranged by members of the Chamber of Commerce, Dallas, Tex., for the construction of the Dallas Vocational School. A fund is being developed for the project and work will soon commence. A board of directors has been formed, with E. T. Jackson, former president of the Chamber of Commerce, as chairman.

The Tidal Oil Co., Corsicana, Tex., a subsidiary of the Standard Oil Co., 26 Broadway, New York, has acquired the local plant and property of the Southern Exploration Co., with headquarters at Houston, Tex., for \$596,000. The new owner plans the development of the property and proposes to install electric power and other equipment.

Pacific Coast

SAN FRANCISCO, March 5.

PLANs are being drawn by the California Wire Co., Orange, Cal., for a one-story addition, totaling about 7200 sq. ft., for which foundations will soon be laid.

The Atchison, Topeka & Santa Fe Railway Co., Kerchhoff Building, Los Angeles, has tentative plans for new locomotive and car repair shops at Richmond, Cal., estimated to cost \$160,000 including equipment.

An ice and pre-cooling plant will be installed in the new packing house to be erected by the West Ontario Citrus Association, Monte Vista, Cal. The entire plant will cost about \$200,000. William Hartley is general manager.

The Mountain States Power Co., Sandpoint, Idaho, will soon commence the construction of a new steam-operated electric generating plant near North Bend, Ore., estimated to cost \$175,000.

The Pacific Wire Works, 4515 Sixth Avenue, South, Seattle, has awarded a contract to John H. Florence, 1151 Sixteenth Avenue, N. E., for a one-story machine and general repair shop.

The Standard Rock Crushing & Gravel Co., Uplands, Cal., is perfecting plans for the installation of a new rock crushing plant in the vicinity of Fourteenth Street, on land owned by the Mountain View Water Co., estimated to cost \$250,000 with machinery. A power house will be installed.

The Fisher-Gaffney Body Co., 555 Bryant Street, San Francisco, has preliminary plans for a new two-story works, 120 x 150 ft., estimated to cost \$65,000.

The Valdalla Irrigation District, Porterville, Cal., is planning the construction of a series of electric-operated pumping plants in connection with its proposed irrigation project, for which a bond issue of \$210,000 has been approved.

The National Ice Co., Postal Telegraph Building, San Francisco, has filed plans for a one-story ice-manufacturing plant, 75 x 110 ft., at Glendale, Cal., on which work will commence at once. It will cost about \$35,000 with equipment.

The California Truck Co., Los Angeles, has leased a four-story building, 110 x 375 ft., to be erected at Sixth and Imperial Streets by the Atchison, Topeka & Santa Fe Railway Company. It is expected to add two more stories later. The California company will use it as a distributing works.

An ice and refrigerating plant will be installed in the new fruit storage building, 80 x 250 ft., to be erected by the Northern Railway Co., Seattle, Wash., estimated to cost \$115,000.

South Atlantic States

BALTIMORE, March 10.

THE Consolidated Gas, Electric Light & Power Co., Lexington Building, Baltimore, has plans for a two-story automatic electric power substation at 409-19 Tyson Street, 75 x 85 ft., estimated to cost \$175,000 with equipment. The engineering department is in charge.

D. C. Elphinstone, 408 Continental Building, Baltimore, machinery dealer, has inquiries out for one 90 hp. horizontal return tubular boiler; one stiff-leg derrick, with 50-ft. boom; one 60-in. steam shovel, Marion type; two 11 x 16-in. locomotives, 36-in. gage; one 18-ton locomotive, 36-in. gage, Vulcan or Porter type, and a number of two-way dump cars, 36-in. gage, each about 4 yds. capacity.

E. M. Smith, Jr., city clerk, Thomasville, Ga., will take bids until March 24 for equipment for a municipal power plant, including one steam turbine, 700 kw. capacity, with generator and auxiliary equipment; also steam boiler and accessory apparatus. D. Rhett Pringle, superintendent of the water and light department, in charge.

The Bureau of Supplies and Accounts, Navy Department, Washington, will take bids until March 25 for miscellaneous electric wires and cable for Eastern and Western yards, schedule 1967; also for a quantity of brass, bronze, copper and similar materials, for Eastern and Western yards, schedule 1957.

Dr. N. P. Pratt, care of Charles O. Lenz, engineer, Atlanta, Ga., is at the head of project to construct and operate a hydroelectric generating plant on the Coosawattee River, Gilmer County, Ga., estimated to cost \$4,500,000, with steel tower transmission system. A corporation is being formed to carry out the enterprise.

The Southern Railway Co., Washington, has plans for the construction of an engine terminal, with locomotive repair shops at Spencer, N. C., to include a machine shop for light repair work, flue shop, babbitt shop, engine house to accommodate 37 locomotives, and miscellaneous buildings. A 10-ton traveling crane, 25 ft. span, will be installed. H. W. Miller is vice-president, in charge.

The Wilson-Hock Co., City Point, Va., machinery dealer, has inquiries out for a 50-ton locomotive; also for a number of steel stacks, 40 to 80 ft. high, self-supporting or high-guyed; one 500 kw. turbo-generator, with auxiliaries; and for one beam scale, suitable for handling cotton bales.

The Board of Commissioners, District Building, Washington, will take bids until March 17 for one motor-driven centrifugal pump, with accessories.

The Commissioners of Public Works, Newberry, S. C., M. L. Spearman, chairman, will take bids until March 27 for equipment for a water supply system, including pumping plant and machinery, intake, filtration equipment, etc. Paul H. Norcross, 1404 Candler Building, Atlanta, Ga., is consulting engineer.

The Board of Awards, office of the City Register, Baltimore, will take bids until March 19 for the erection of the proposed junior high school in the Gwynn's Falls Park section, estimated to cost \$1,350,000. The work will include a vocational training building, with equipment for machine shop, woodworking, sheet-metal working and electrical work. Smith & May, Calvert Building, are architects; Henry Adams, Calvert Building, is consulting mechanical engineer.

Ralph H. Ackerman, Santiago, Chile, commercial attaché, Bureau of Foreign and Domestic Commerce, Washington, has information regarding an automobile manufacturer in the United States who plans the construction of an assembling plant at Santiago, for which a site is being selected.

The Gulf Refining Co., Frick Annex, Pittsburgh, is reported to be planning the construction of an oil storage and distributing plant at Charleston, S. C., on tract of land near Shipyard Creek, totaling 40 acres, recently acquired, to cost about \$800,000 including equipment.

The Renouss-Kleinle Division, Pittsburgh Plate Glass Co., Frick Building, Pittsburgh, has awarded a general contract to the Charles L. Stockhausen Co., Gay and Water Streets, Baltimore, for a four-story and basement addition, 60 x 142 ft., at its Baltimore works, 3221 Frederick Avenue, to cost \$200,000. Additions will also be made to the power house.

The United Railways & Electric Co., Continental Building, Baltimore, is arranging a fund of \$600,000 for the erection of four automatic power substations on local sites.

The Speakman Co., Tatnall Street, Wilmington, Del., manufacturer of plumbing fixtures and equipment, has filed plans for a one-story addition to its foundry, estimated to cost \$60,000 with equipment.

Fire, March 6, destroyed a portion of the plant of the Yarbrough & Bellinger Coal & Ice Co., Charlotte, N. C., with loss estimated at \$30,000, including ice-making and other equipment. It is planned to rebuild.

Canada

TORONTO, March 10.

WITH the approach of spring the demand for machine tools is beginning to show signs of improvement. Industrial concerns throughout the Dominion are preparing to go ahead with additions and the erection of new plants, for which large quantities of new equipment will be required. The placing of orders for rolling stock by the Canadian National is being reflected in more extensive tool buying by car building concerns. The Canadian National Railways have issued a fair-sized list of tools required for its Eastern shops. While some of these will be purchased in the Dominion, a few of the larger tools, such as turret lathes, etc., are expected to be placed with United States dealers or builders. It is also expected that the Canadian Pacific Railway will enter the market shortly for tools for shop equipment and replacement purposes.

The City Council, Fredericton, N. B., will apply to the Provincial Legislature this month for bond issue to cover purchase of a pumping unit to cost \$25,000. Engine and pump will be purchased. Steam and crude oil types are being considered.

The Canadian Westinghouse Co., Aberdeen Street West, Hamilton, Ont., is making rapid progress on the erection of a foundry to cost \$400,000 and is in the market for molding equipment, melting furnaces, jib and traveling electric cranes, etc.

P. L. Davis, 238 Ontario Street West, Montreal, will purchase a drill press and small lathe.

N. Laroche, 99 Vinet Street, Montreal, is in the market for a tool room lathe, air compressor and grinding stand.

Bids are being received by the Bickle Fire Engines, Ltd., Young Street, Woodstock, Ont., through the president, Robert S. Bickle, for the erection of a factory to cost \$20,000. Plans and specifications are with the owner. It will be 45 x 200 ft., two-stories, adjoining its present plant. The company was recently incorporated to take over the business of the Bickle Fire Engine Co., operated as a partnership. The executive personnel is retained with the exception of W. G. Bain, who is vice-president of the reorganized company. It is stated that considerable equipment will be purchased for the addition early this spring.

The Golden Lake Lumber Co., Golden Lake, Ont., is asking for prices and information on complete sawmill equipment for factory to be erected at Renfrew, Ont.

M. A. Bradshaw, 1483 Chateaubriand Street, Montreal, is in the market for machinery for the manufacture of boxes.

It is reported that the E. B. Eddy Co., Ottawa, Ont., plans to replace its present equipment, which has been in continuous use for 36 years, with modern sulphite-making machinery.

Pratt, Hanley & Pratt, Midland, Ont., have been awarded the general contract for the erection of a \$500,000 addition to the grain elevator owned by the Midland Grain Elevator Co., Ltd., Midland.

The Town Council, La Tuque, Que., plans the construction of power development plant to cost \$50,000 on Petite and Grande Bostonnais Rivers, near La Tuque.

In addition to other undertakings, the Canadian Pacific Railway plans the erection this year of engine houses and engine house extensions at Three Rivers, St. Gabriel, Grand Piles, Que., Orangeville, Ont., Chalk River, and Schreiber, and a coaling plant at Webbwood; also several water tanks of 60,000-gal. capacity.

Plans have been completed for the establishing of a plant at Cape Rouge, Que., comprising both pulp and paper mills, for the St. Regis Pulp & Paper Co., Quebec, at a cost of \$5,000,000. It is stated that construction will start early this spring. It is also announced that within a few years the total expenditure on the plant will amount to \$8,000,000.

Western Canada

Flanagan Brothers, White Rock, B. C., have started work on the erection of a sawmill on the Campbell River Road, in which electrically operated machinery will be installed. It will have a capacity of 20,000 ft. per day.

The Vulcan Iron Works, Vancouver, B. C., will erect a machine shop adjoining its plant on Industrial Island.

The Saskatchewan Co-Operative Elevator Co., Ltd., Winnipeg, is having plans prepared by C. D. Howe, Port Arthur, Ont., for the erection of a terminal elevator at Vancouver, B. C., to cost \$1,000,000.

C. D. Howe, Port Arthur, Ont., is preparing plans for a terminal elevator to cost \$1,000,000 for the United Grain Growers, Ltd., Winnipeg, to be erected at Vancouver, B. C.

Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The following quotations are made by New York City warehouses.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipments in carload lots from mills, these prices are given for their convenience.

On a number of items the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general heading of "Iron and Steel Markets" and "Non-Ferrous Metals."

Bars, Shapes and Plates

	Per Lb.
Refined iron bars, base price	3.54c.
Swedish charcoal iron bars, base....	7.00c. to 7.25c.
Soft steel bars, base price	3.54c.
Hoops, base price	5.19c.
Bands, base price	4.39c.
Beams and channels, angles and tees, 3 in. x ¼ in. and larger, base.....	3.64c.
Channels, angles and tees under 3 in. x ¼ in., base	3.54c.
Steel plates, ¼ in. and heavier	3.64c.

Merchant Steel

	Per Lb.
Tire, 1½ x ½ in. and larger.....	3.60c.
(Smooth finish, 1 to 2½ x ¼ in. and larger) ..	4.10c.
Toe-calk, ½ x ¾ in. and larger	4.60c.
Cold-rolled strip, soft and quarter hard..	7.50c. to 8.50c.
Open-hearth, spring steel	4.50c. to 7.50c.
Shafting and Screw Stock:	
Rounds	4.40c.
Squares, flats and hex.....	4.90c.
Standard tool steel, base price	15.00c.
Extra tool steel	18.00c.
Special tool steel	23.00c.
High-speed steel, 18 per cent tungsten.....	75c. to 80c.

Sheets

	Per Lb.
<i>Blue Annealed</i>	
No. 10	4.34c.
No. 12	4.39c.
No. 14	4.44c.
No. 16	4.54c.

Box Annealed—Black

	Soft Steel C. R., One Pass Per Lb.	Blued Stove Pipe Sheet Per Lb.
Nos. 18 to 20	4.55c. to 4.60c.
Nos. 22 and 24	4.70c. to 4.75c.	5.10c.
No. 26	4.75c. to 4.80c.	5.15c.
No. 28*	4.85c. to 4.90c.	5.25c.
No. 30	5.05c. to 5.10c.

Galvanized

	Per Lb.
No. 14	4.95c. to 5.00c.
No. 16	5.10c. to 5.15c.
Nos. 18 and 20	5.25c. to 5.30c.
Nos. 22 and 24	5.40c. to 5.45c.
No. 26	5.55c. to 5.60c.
No. 28*	5.85c. to 5.90c.
No. 30	6.30c. to 6.35c.

*No. 28 and lighter, 36 in. wide, 20c. higher.

Welded Pipe

Standard Steel			Wrought Iron		
	Black	Galv.		Black	Galv.
½ in. Butt... —41 —24			½ in. Butt... —4		+19
¾ in. Butt... —46 —32			¾ in. Butt... —11		+9
1-3 in. Butt... —48 —34			1-1½ in. Butt... —14		+6
2½-6 in. Lap... —44 —30			2 in. Lap... —5		+14
7-8 in. Lap... —41 —11			2½-6 in. Lap... —9		+9
9-12 in. Lap... —34 —6			7-12 in. Lap... —3		+16

Bolts and Screws

Machine bolts, cut thread, 45 and 10 to 50 and 10 per cent off list	
Carriage bolts, cut thread, 35 to 35 and 10 per cent off list	
Coach screws	45 to 50 and 10 per cent off list
Wood screws, flat head iron, 75, 20, 10 and 7½ per cent off list	

Steel Wire

	Per Lb.
Bright basic	4.50c. to 4.75c.
Annealed soft	4.50c. to 4.75c.
Galvanized annealed	5.15c. to 5.40c.
Coppered basic	5.15c. to 5.40c.
Tinned soft Bessemer	6.15c. to 6.40c.

*Regular extras for lighter gage.

Brass Sheet, Rod, Tube and Wire

	BASE PRICE
High brass sheet	17¼c. to 18¼c.
High brass wire	18¼c. to 19¼c.
Brass rods	15½c. to 16½c.
Brass tube, brazed	25¼c. to 27¼c.
Brass tube, seamless	22 c. to 23 c.
Copper tube, seamless	23 c. to 24 c.

Copper Sheets

Sheet copper, hot rolled, 20½c. to 21c. per lb. base.	
Cold rolled, 14 oz. and heavier, 3c. per lb. advance over hot rolled.	

Tin Plates

Bright Tin	Grade	Grade	Coke—14 x 20	Prime	Seconds
	"AAA"	"A"			
	Charcoal	Charcoal	80 lb..	\$6.55	\$6.30
	14x20	14x20	90 lb..	6.65	6.40
	IC..	\$11.75	100 lb..	6.75	6.50
	IX..	13.25		IC..	7.00
	IXX..	14.50		IX..	8.25
	IXXX..	15.50		IXX..	9.50
	IXXXX..	16.50		IXXX..	10.75
		14.75		IXXXX..	12.00

Terne Plates

	8 lb. coating, 14 x 20
100 lb.	\$7.00 to \$8.00
IC	7.25 to 8.25
IX	8.25 to 8.75
Fire door stock	9.00 to 10.00

Tin

Straits pig	62c.
Bar	68c. to 70c.

Copper

Lake ingot	15½c.
Electrolytic	15 c.
Casting	14 c.

Spelter and Sheet Zinc

Western spelter	8c.
Sheet zinc, No. 9 base, casks.....	10¼c. open 11¼c.

Lead and Solder*

American pig lead	11c. to 12c.
Bar lead	14c. to 15c.
Solder ½ and ½ guaranteed	40c.
No. 1 solder	38c.
Refined solder	34c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb.....	75c. to 90c.
Commercial grade, per lb.....	35c. to 50c.
Grade D, per lb.....	25c. to 35c.

Antimony

Asiatic	13c. to 14c.
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Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb.....	36c.
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Old Metals

Values are advancing and demand is good. Dealers' buying prices are as follows:

	Cents Per Lb.
Copper, heavy crucible	12.00
Copper, heavy wire	11.25
Copper, light bottoms.....	9.50
Brass, heavy	6.75
Brass, light	5.50
Heavy machine composition	9.25
No. 1 yellow brass turnings.....	7.25
No. 1 red brass or composition turnings ..	8.75
Lead, heavy	8.00
Lead, tea	6.25
Zinc	4.50
Cast aluminum	17.00
Sheet aluminum	17.00